Bang&Olufsen

Beovision M20
Type 3101, 3102, 3103, 3104, 3105

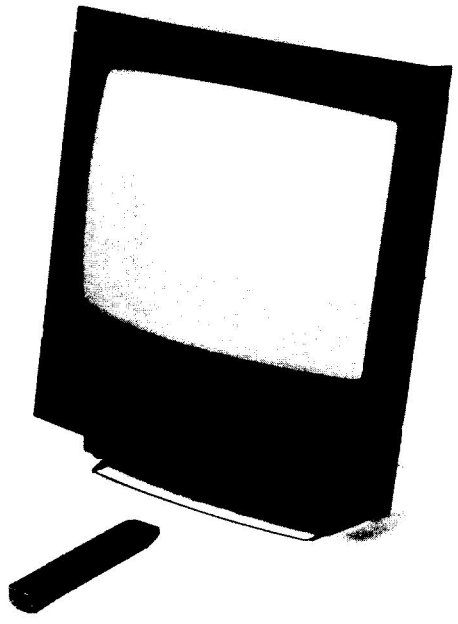
Beovision MX2000
Type 3116, 3117, 3118, 3119, 3120

TV System
Type 3101, 3102, 3103, 3116, 3117, 3118
VHF: B
UHF: G
Colour: PAL

Type 3104, 3105, 3119, 3120
UHF: I
Colour: PAL

Installation kits:
PAL/Secam Decoder
Teletext

Accessories:
TV Stand
Video Stands
Indoor antenna



SERVICE MANUAL

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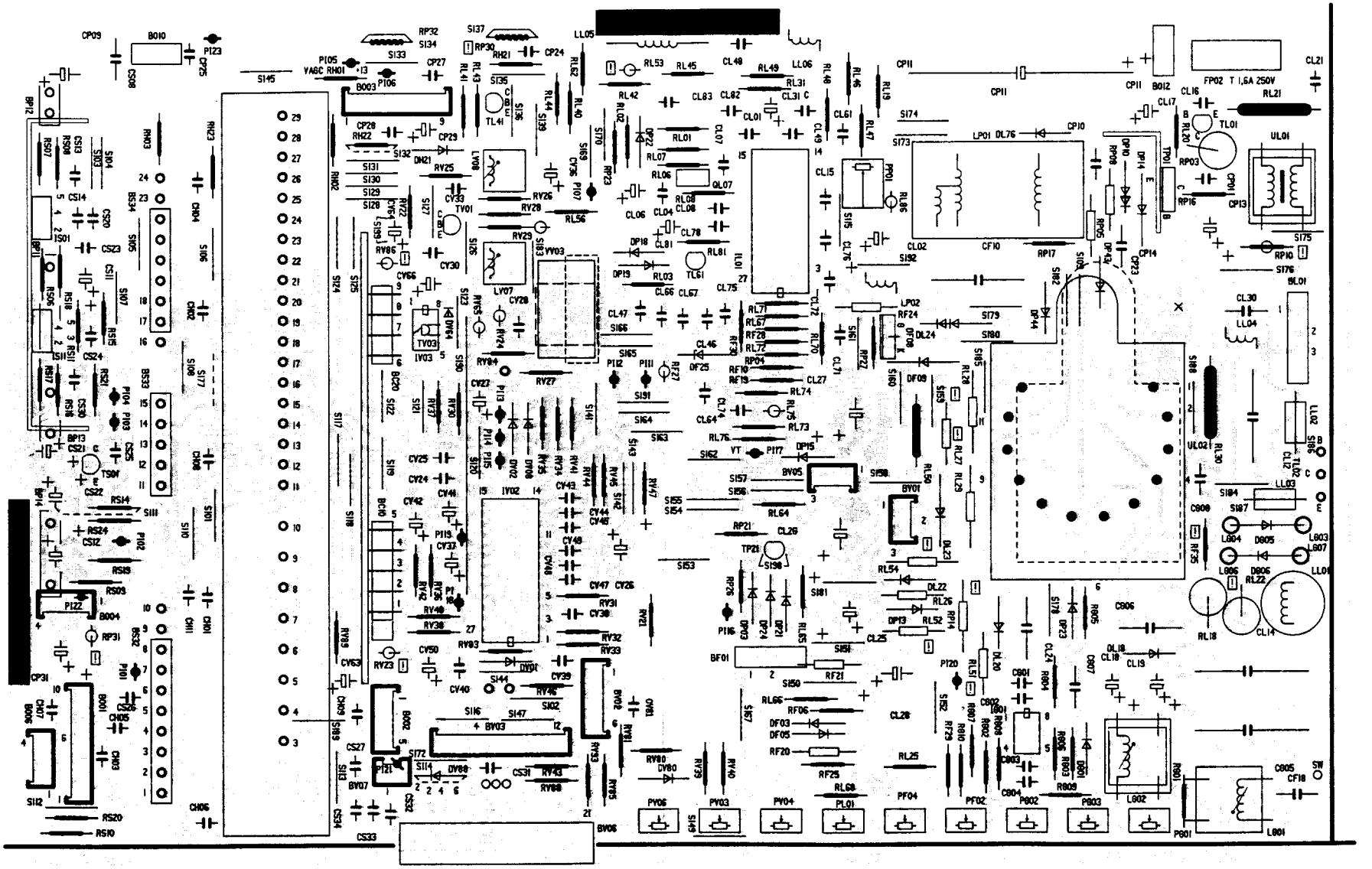
Basic Board PCB01



H 270 V_{ss} (V_{pp})

V 150 V_{ss} (V_{pp}) (D4)

H 190 V_{ss} (V_{pp}) (D3)

H 1200 V_{ss} (V_{pp}) (H7)

H 15 V_{ss} (V_{pp}) (H8)

H 58 V_{ss} (V_{pp}) (N5)

H 5 V_{ss} (V_{pp}) (N4)

H 2 V_{ss} (V_{pp}) (D1)

H 20 V_{ss} (V_{pp})

U3 21V

U4 200V

U2a 13V

V 3 V_{ss} (V_{pp}) (G3)

H 1,6 V_{ss} (V_{pp})

H 1,5 V_{ss} (V_{pp})

V 14,5 V_{ss} (V_{pp}) (B5)

H 1,9 V_{ss} (V_{pp})

EURO-Norm

U8 110V

H 10 V_{ss} (V_{pp}) (M8)

H 12 V_{ss} (V_{pp}) (M6)

H 6,5 V_{ss} (V_{pp}) (M7)

H 26 V_{ss} (V_{pp})

On 0,1 s 15 1,6 s
7 V_{ss} (V_{pp}) (L6)

U2 13V

H 0,4 V_{ss} (V_{pp})

U1 145V

U5 7V

H 10 V_{ss} (V_{pp}) (M9)

H 2 V_{ss} (V_{pp}) (K3)

U7 31V

H 2 V_{ss} (V_{pp}) (B3)

H 1,4 V_{ss} (V_{pp}) (F2)

H 0,4 V_{ss} (V_{pp}) (F5)

U9 12V

V 9,5 V_{ss} (V_{pp}) (F3)

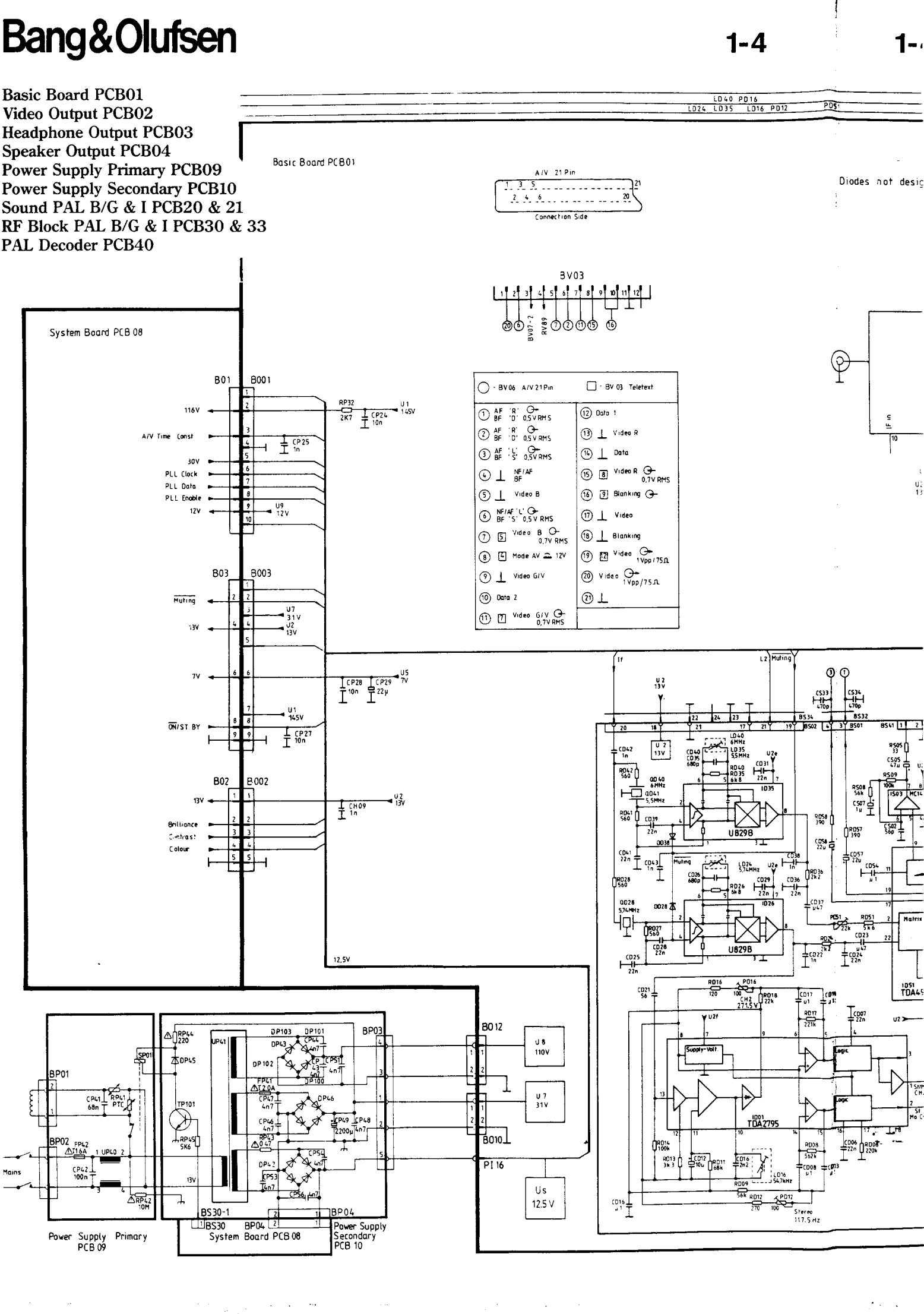
H 9,5 V_{ss} (V_{pp}) (F3)

H 2 V_{ss} (V_{pp}) (F4)

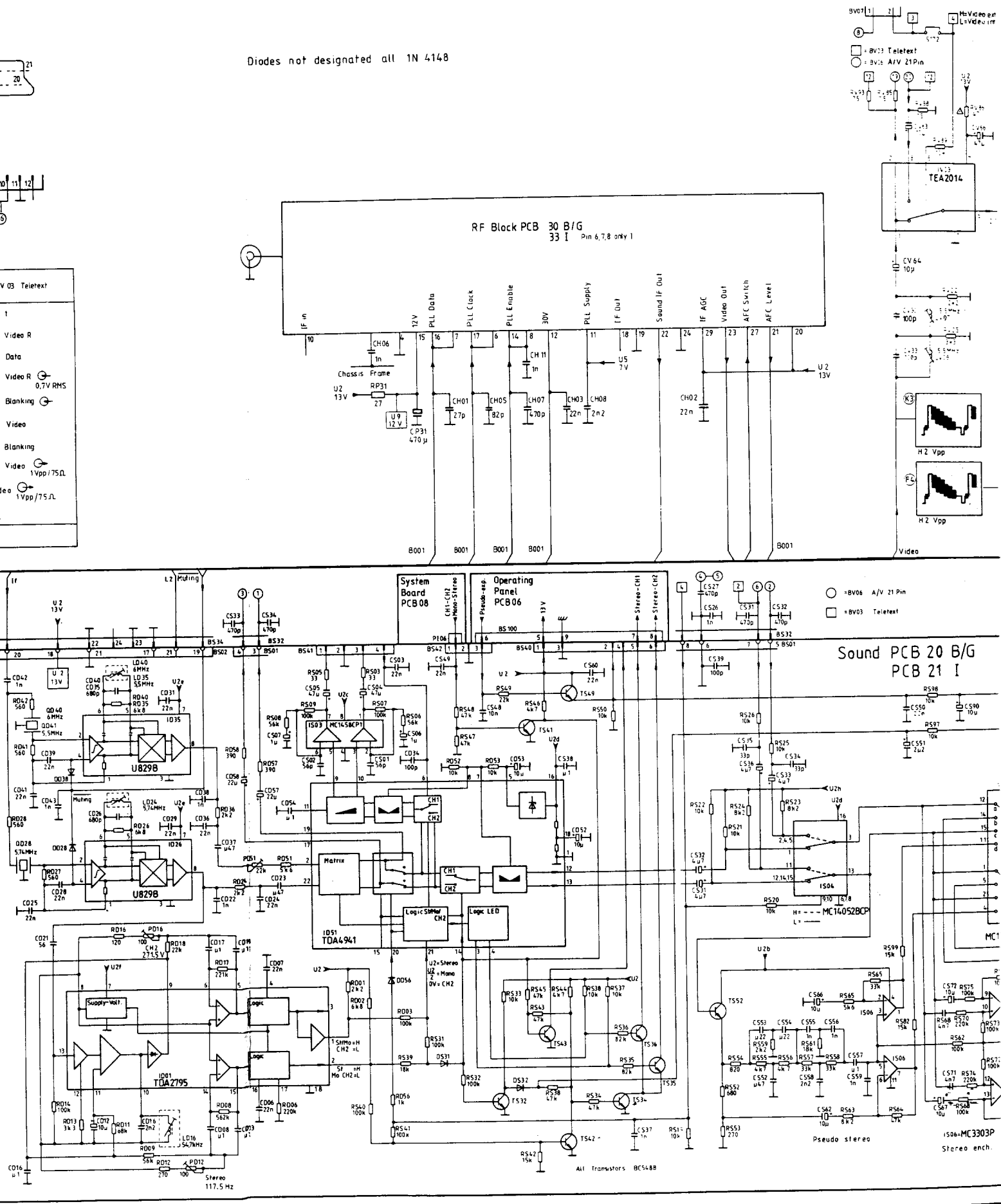
ICC 3005

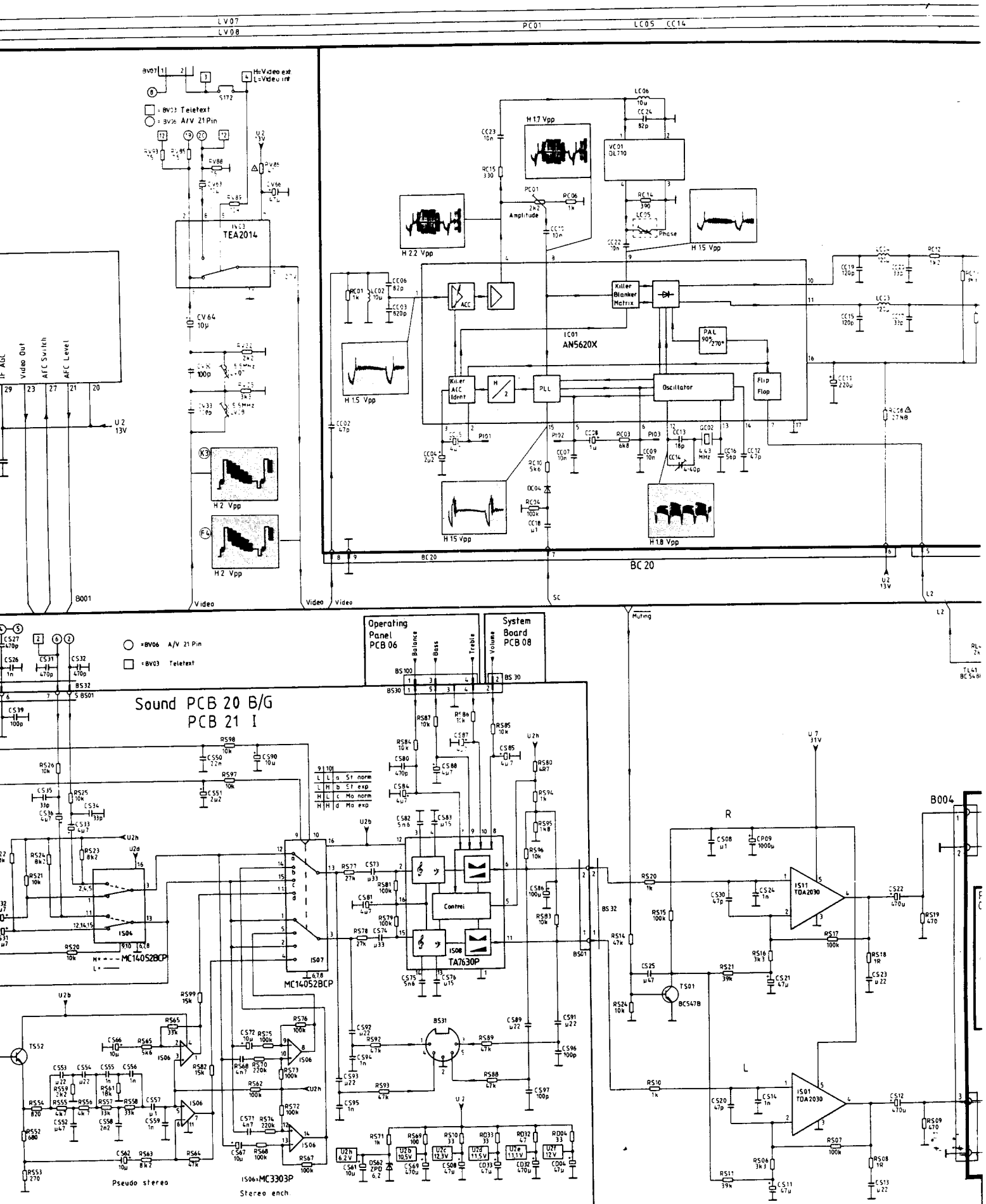
550063101000

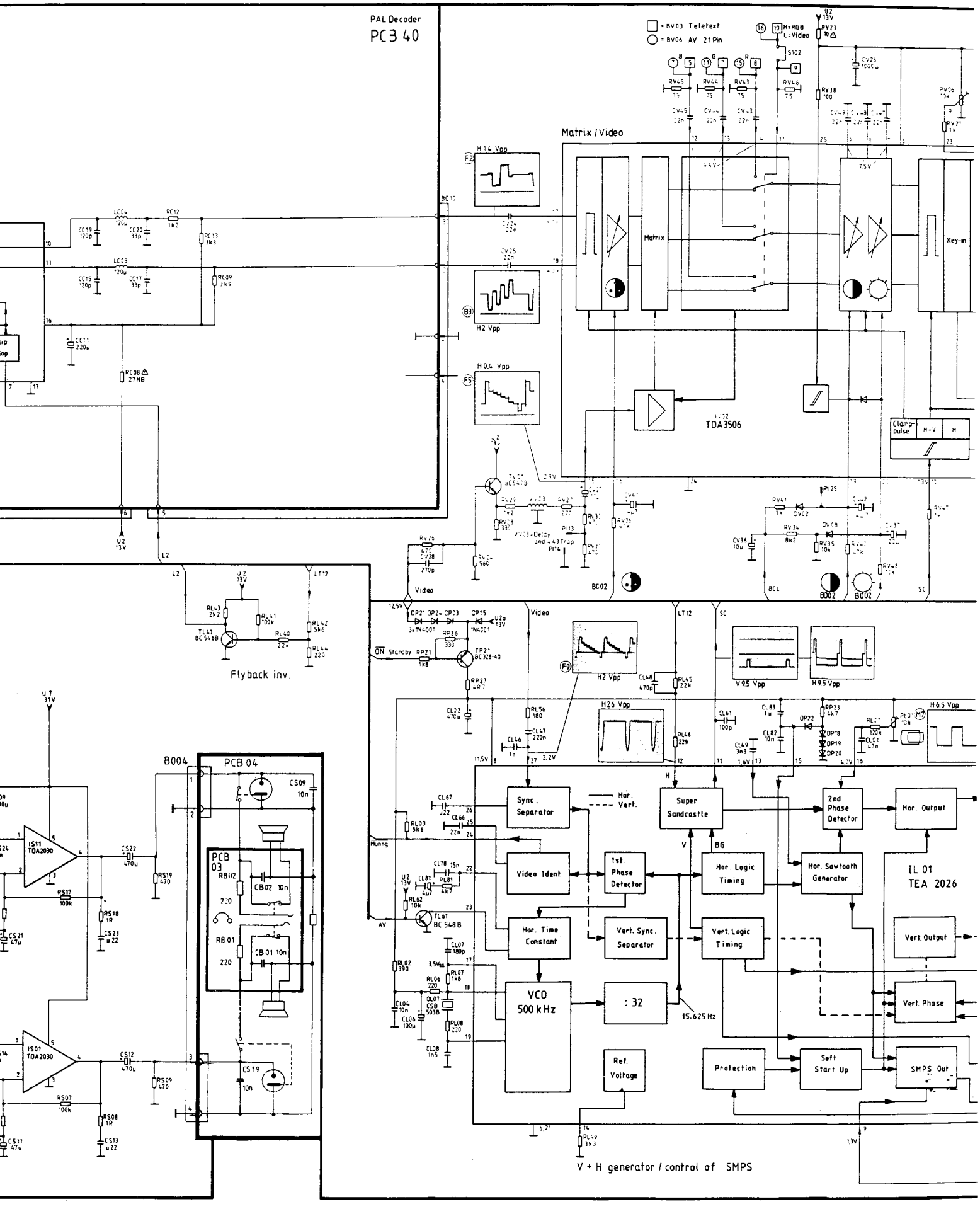
Basic Board PCB01
Video Output PCB02
Headphone Output PCB03
Speaker Output PCB04
Power Supply Primary PCB09
Power Supply Secondary PCB10
Sound PAL B/G & I PCB20 & 21
RF Block PAL B/G & I PCB30 & 33
PAL Decoder PCB40



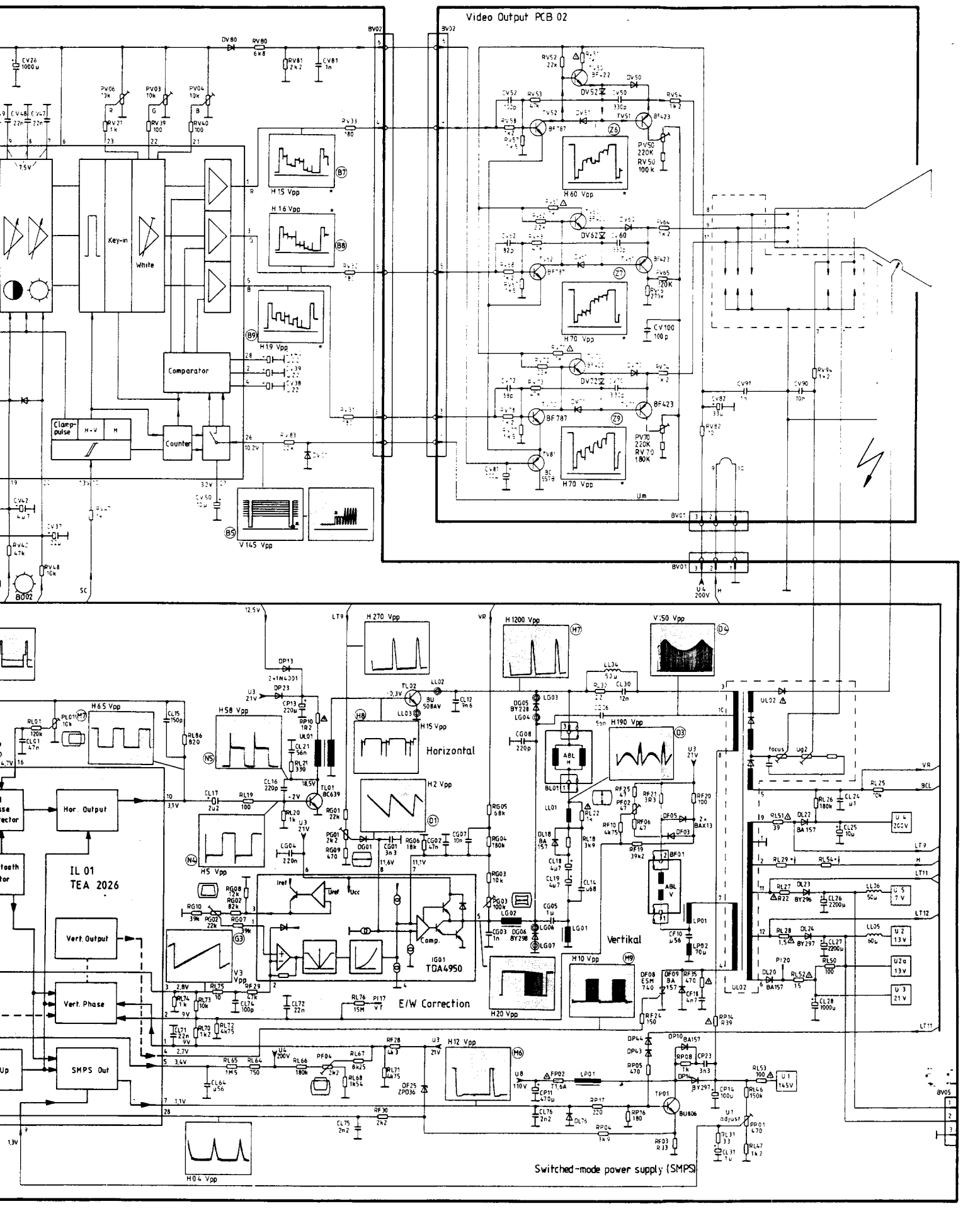
Diodes not designated all 1N 4148




TEA2014
AN5620X
TA7630P
MC14052BCP
MC3303P
Sound PCB 20 B/G
PCB 21 I
Operating Panel PCB 06
System Board PCB 08
Pseudo stereo
Stereo ench.
Video
BC 20
Muting


PAL Decoder
PC3 40
Matrix / Video
Matrix
Key-in
TDA3506
Clamp-pulse
H-V
H
Video
Flyback inv.
PCB 04
B004
PCB 03
Sync. Separator
Hor.
Vert.
Super Sandcastle
2nd Phase Detector
Hor. Output
Video Ident.
1st. Phase Detector
Hor. Logic Timing
Hor. Sawtooth Generator
IL 01
TEA 2026
Hor. Time Constant
Vert. Sync. Separator
Vert. Logic Timing
Vert. Output
VCO
500 kHz
: 32
15.625 Hz
Vert. Phase
Ref. Voltage
Protection
Soft Start Up
SMPS Out
V + H generator / control of SMPS

1-4


PV04
PG01
PV50
PL01
PV06
PV03
PG02
PF04
PG03
PF02
PV70
PP01
Ug2
Video Output PCB 02
Key-in
White
Comparator
Clamp-pulse
Counter
H 15 Vpp
H 16 Vpp
H 19 Vpp
H 60 Vpp
H 70 Vpp
H 70 Vpp
V 145 Vpp
BF 787
BF 423
Horizontal
Vertikal
E/W Correction
Switched-mode power supply (SMPS)
IL 01
TEA 2026
Hor. Output
Vert. Output
Vert. Phase
SMPS Out
TDA4950
H 270 Vpp
H 1200 Vpp
V 150 Vpp
H 190 Vpp
H 65 Vpp
H 58 Vpp
H 2 Vpp
H 5 Vpp
H 10 Vpp
H 20 Vpp
H 12 Vpp
H 04 Vpp
V3 Vpp

Chassis F 11 B

HF-Block
RF block
Unità AF
MTS 2020 SM

563.818

Bandumschaltung
Band switch
Commutazione di banda

A	B	C	
L	H	L	Band I
L	H	H	Band III
H	L	L	Band IV/V

Chassisrahmen
Chassis frame
Telaio del chassis

zur Systemplatte
to system board
verso piastra sistema
Stecker/plug/spina BV 07

= BV03 VT
= BV06 EURO Normbuchse

H=FBAS ext.
L=FBAS int.

IV03 TEA2014

Fi304 38,9MHz
Fi305* 38,9MHz
Fi306

IC202 SDA2101
IC215 SDA2002
IS01 TDA4940
IS80 TDA4944
IS85 TBA120T
IS50 = MC3303P
IC301 TDA2541/4

Europa-Normbuchse
BV 06 Eurosocket
Presa peritelevisione

Anschlußseite / Connection side / Lato collegamento

BV 03 Videotext / Televideo

= BV 06 Europa-Normbuchse Eurosocket Presa peritelevisione	= BV 03 Videotext Televideo
1 NF/AF 'R' / BF 'D' 0.5 VRMS	12 Data 1
2 NF/AF 'R' / BF 'D' 0.5 VRMS	13 Video R
3 NF/AF 'L' / BF 'S' 0.5 VRMS	14 Data
4 NF/AF BF	15 Video R 0,7 V RMS
5 Video B	16 Blanking Spegnim. Video
6 NF/AF 'L' / BF 'S' 0.5 VRMS	17 Video
7 Video B 0.7 V RMS	18 Blanking Spegnimento
8 Mode AV ≙ 12 V	19 Video 1 Vpp/75 Ω
9 Video G/V	20 Video 1 Vpp/75 Ω
10 Data 2	21 Chassis Telaio
11 Video G/V 0.7 V RMS	V RMS = Veff, Vpp = Vss

zur Anzeigeplatte
to p.c.b. indicator
verso piastra indicatore

L	H	H	Stereo
L	H	L	T1
H	L	H	T2
H	L	L	Mono

zur Kopfhörerbuchse
to headphone socket
verso presa per cuffia

zur Systemplatte
to system board
verso piastra sistema
Pin/piedio PI 06

zur Systemplatte
to system board
verso piastra sistema
Stecker/plug/spina BP 04

Entmagnetisierung
Degaussing
Smagnetizz.

59.670/701

Ton-ZF/Stereo-Modul
Sound IF Stereo module
Modulo FI tono stereo

PAL-Decoder
Decoder PAL

zur Systemplatte
to system board
verso piastra sistema
Stecker/plug/spina BV 07

= BV03 VT
= BV06 EURO Normbuchse

IV03 TEA2014

IC01 AN5620X

592.675

zur Anzeigeplatte
to p.c.b. indicator
verso piastra indicatore

L	H	H	Stereo
L	H	L	T1
H	L	H	T2
H	L	L	Mono

zur Kopfhörerbuchse
to headphone socket
verso presa per cuffia

zur Reglerplatte
to p.c.b. regulators
verso piastra regolatori
Stecker / plug / spina BE 30

zur Systemplatte
to system board
verso piastra sistema
Pin/piedio PI 06

IS01 TDA4940

IS80 TDA4944

IS50 = MC3303P

IS11 TDA2030

IS01 TDA2030

IC01 TA7630P

Ton-ZF/Stereo-Modul
Sound IF Stereo module
Modulo FI tono stereo

592.859

Ton
Sound
Audio

Matrix / Video
Matrice / Video

RGB-Endstufe
Output stage
Stadio finale

IV02 TDA3506

592.882

Horizontal
Orizzontale

Vertikal
Vertical
Verticale

E/W correction
Correzione E/O

IG01 TDA4950

IL01 TEA 2026 A

V + H-Generator/Ansteuerung Schaltnetzteil
V + H generator/control of SMPS
Generatore V + O/azionamento aliment. commut.

Schaltnetzteil
Switched-mode power supply (SMPS)
Alimentatore commutatore

°nur wenn
only if
solo si
IL 01 = TEA 2026 A

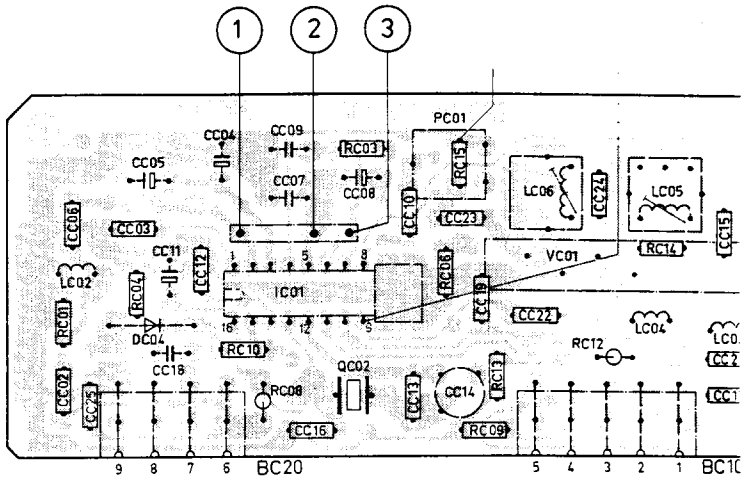
Heizung
Heater
Riscaldamento

ersetzt RV 55 RV 56
replacing RV 55 RV 56
sostituendo RV 55 RV 56

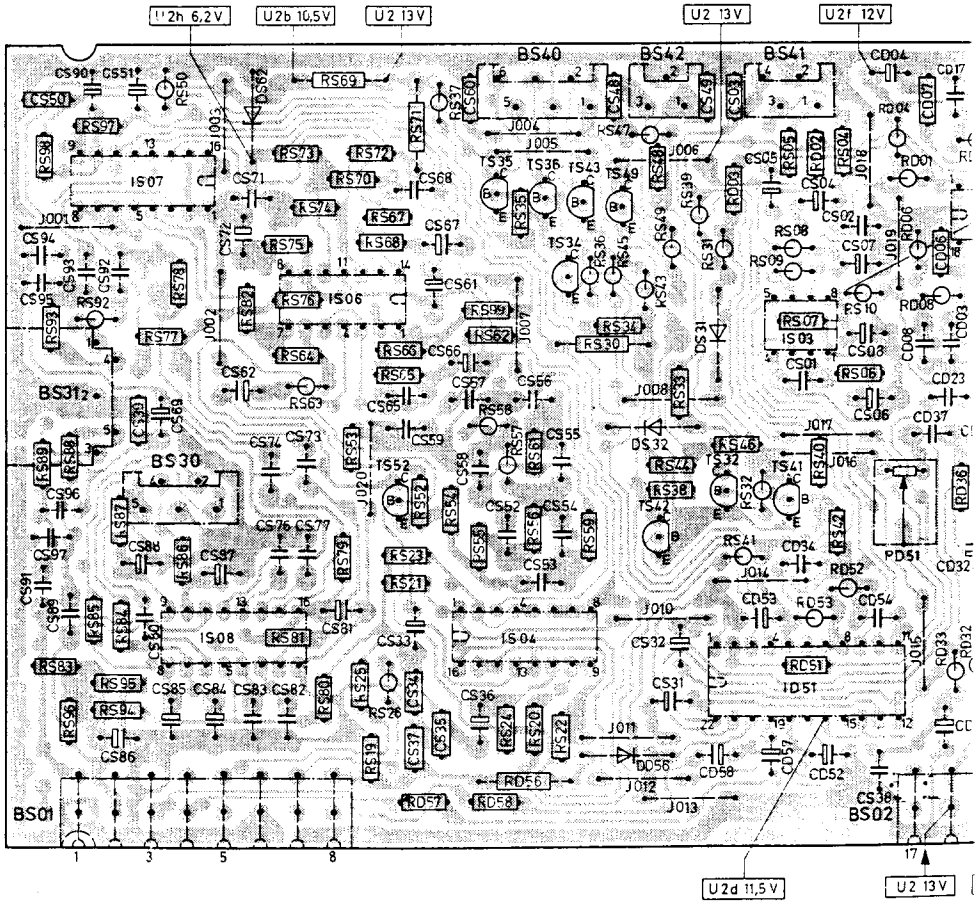
ersetzt RV 75 RV 76
replacing RV 75 RV 76
sostituendo RV 75 RV 76

DST Hitachi
DST Orega

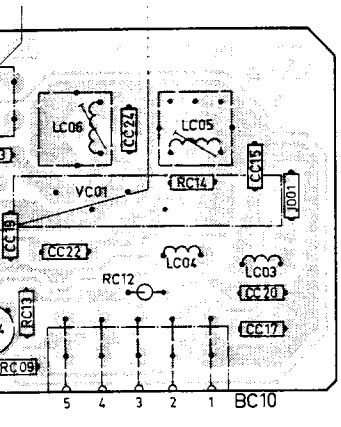
PAL Decoder PCB40

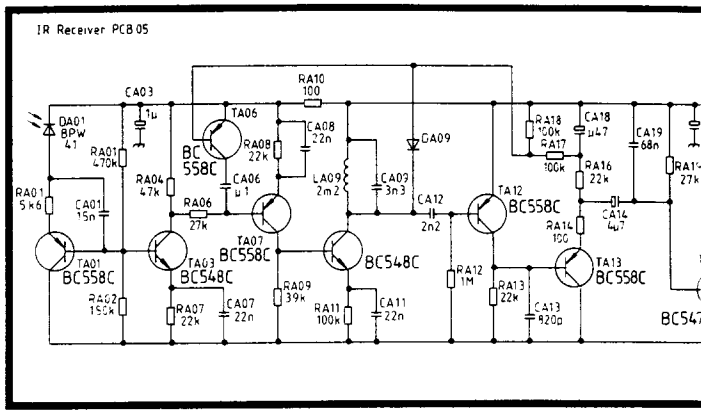


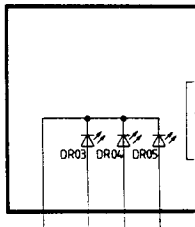
Sound PAL B/G PCB20

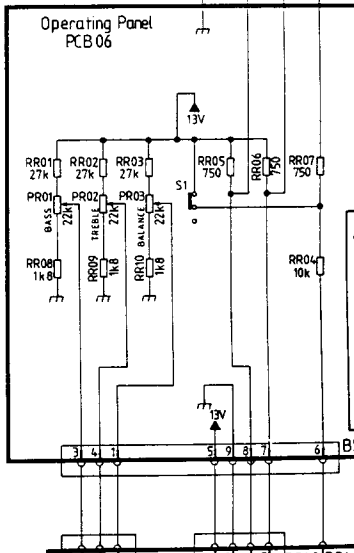


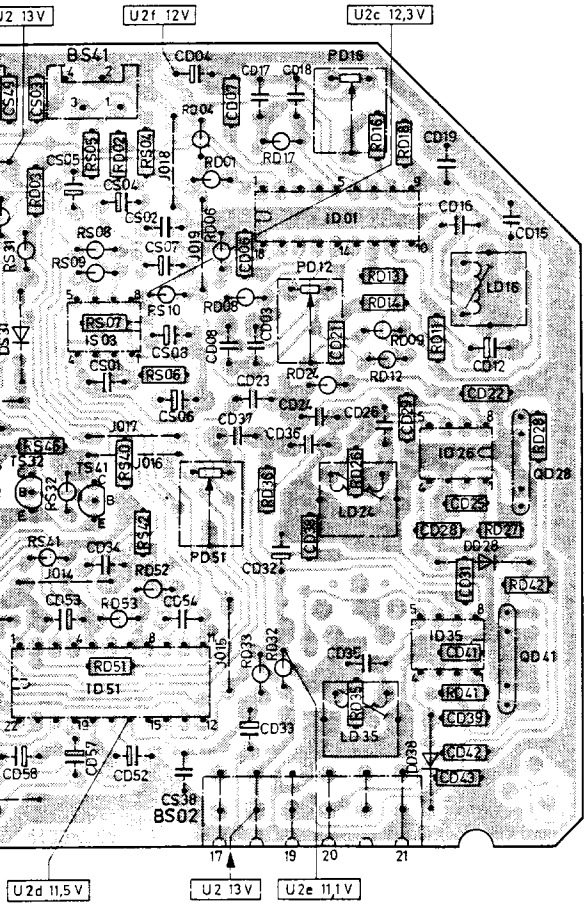
IR Receiver PCB05
Operating Panel PCB06
System Board PCB08
Protection Board PCB11

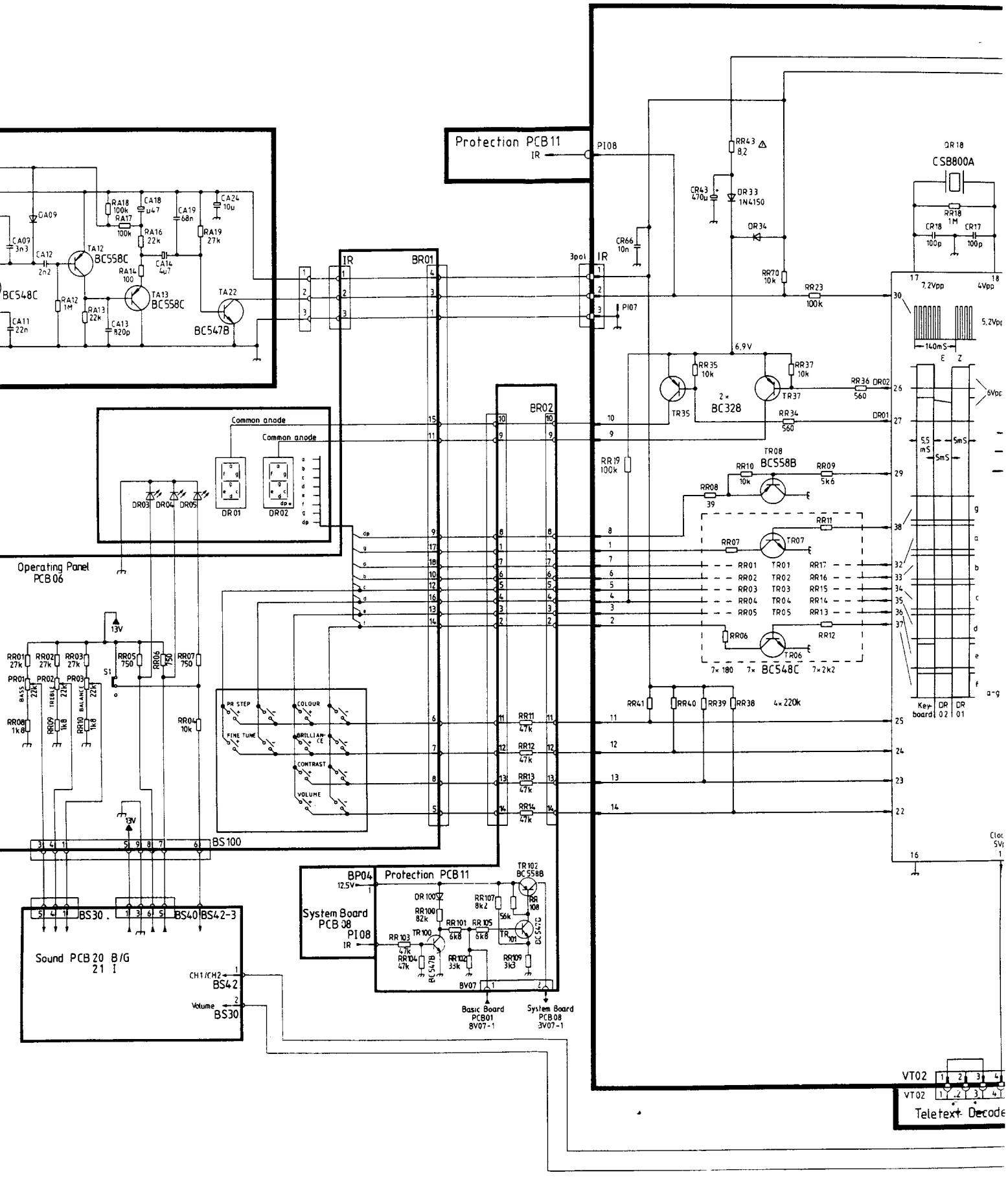




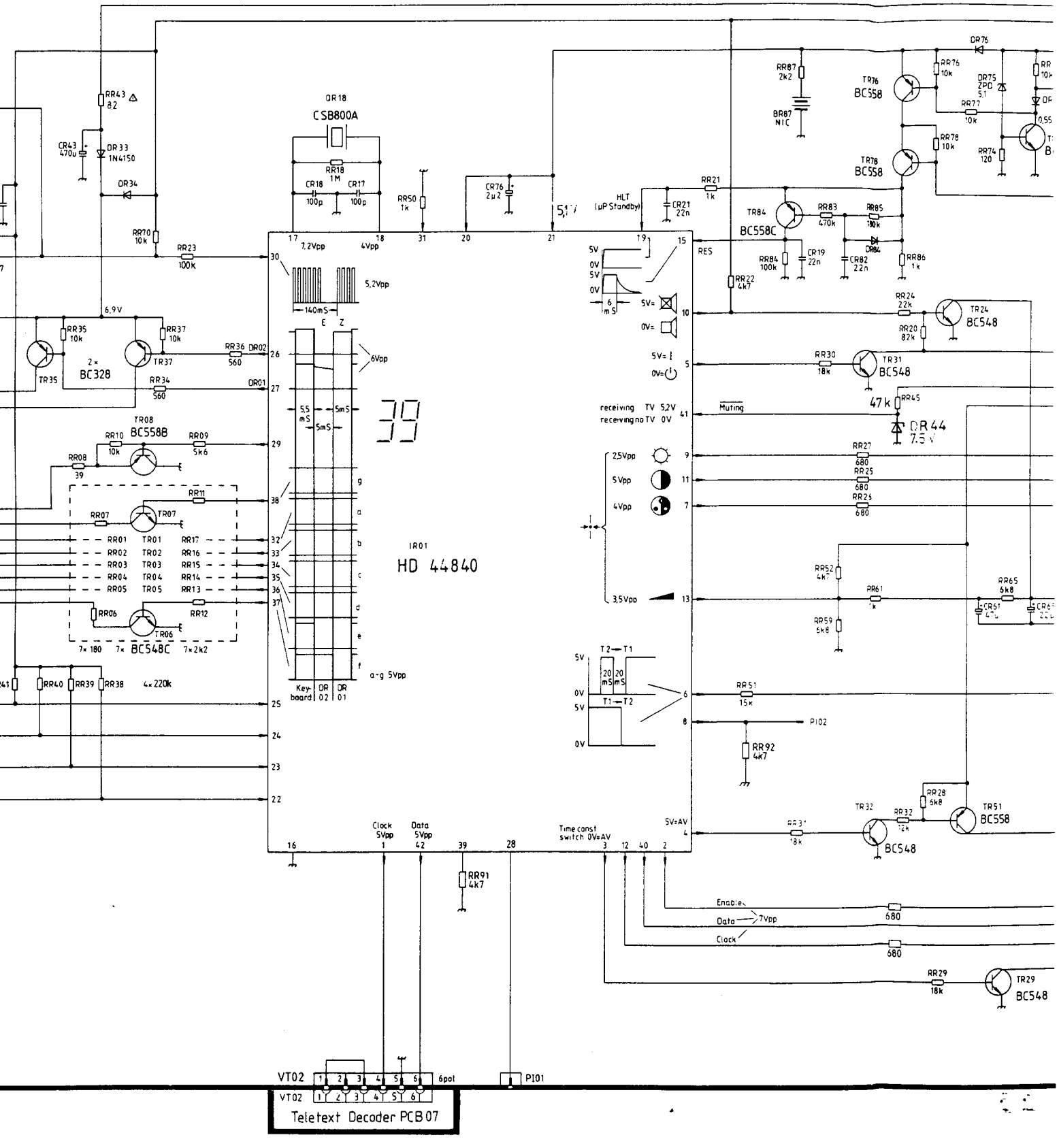


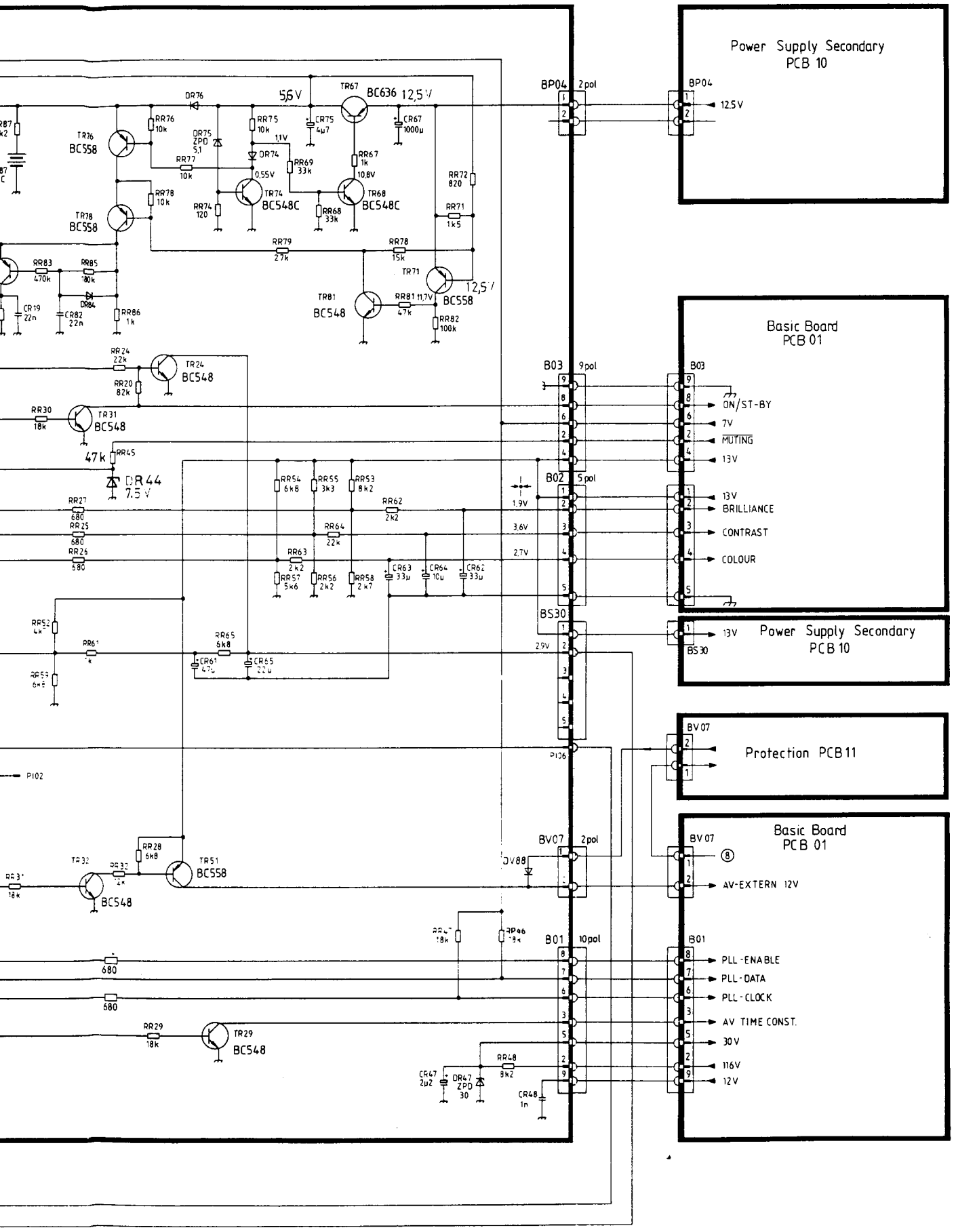




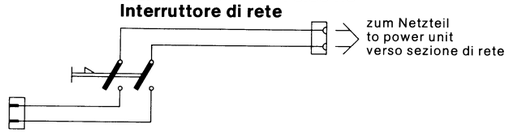

Protection PCB11
IR
PI08
PI07
3pol
BR01
BR02
CSB800A
CR18
CR17
RR18
1M
100p
100p
RR43
8,2
CR43
470µ
DR33
1N4150
DR34
CR66
10n
RR70
10k
RR23
100k
7,2Vpp
4Vpp
5,2Vpp
140mS
6,9V
RR35
10k
RR37
10k
TR35
TR37
2 x
BC328
RR36
560
DR02
RR34
560
DR01
6Vpp
5,5
mS
5mS
5mS
TR08
BC558B
RR10
10k
RR09
5k6
RR08
39
RR19
100k
RR11
RR07
TR07
RR01
TR01
RR17
RR02
TR02
RR16
RR03
TR03
RR15
RR04
TR04
RR14
RR05
TR05
RR13
RR06
RR12
TR06
7x 180
7x BC548C
7x 2k2
RR41
RR40
RR39
RR38
4x 220k
Key-board
DR 02
DR 01
Common anode
Common anode
DR03
DR04
DR05
DR 01
DR 02
Operating Panel
PCB 06
13V
RR01 27k
RR02 27k
RR03 27k
RR05 750
RR06 750
RR07 750
S1
PR01
PR02
PR03
BASS 22k
TREBLE 22k
BALANCE 22k
RR08 1k8
RR09 1k8
RR10 1k8
RR04 10k
PR STEP
FINE TUNE
COLOUR
BRILLIANCE
CONTRAST
VOLUME
RR11 47k
RR12 47k
RR13 47k
RR14 47k
BS100
BS30
BS40
BS42-3
Sound PCB 20 B/G
21 I
CH1/CH2
BS42
Volume
BS30
BP04
12.5V
System Board
PCB 08
PI08
IR
Protection PCB11
TR102
BC558B
DR 100
RR100
82k
RR107
8k2
RR108
56k
RR101
6k8
RR105
6k8
TR100
TR101
BC547B
RR103
47k
RR104
47k
RR102
33k
RR109
3k3
BV07
Basic Board
PCB01
8V07-1
System Board
PCB 08
3V07-1
VT02
Teletext Decode
TA12
BC558C
TA13
BC558C
TA22
BC547B
BC548C
RA18 100k
RA17 100k
RA16 22k
RA19 27k
RA14 100
CA18 u47
CA19 68n
CA24 10u
CA14 4u7
CA09 3n3
CA12 2n2
CA11 22n
RA12 1M
RA13 22k
CA13 820p

System Board PCB 08

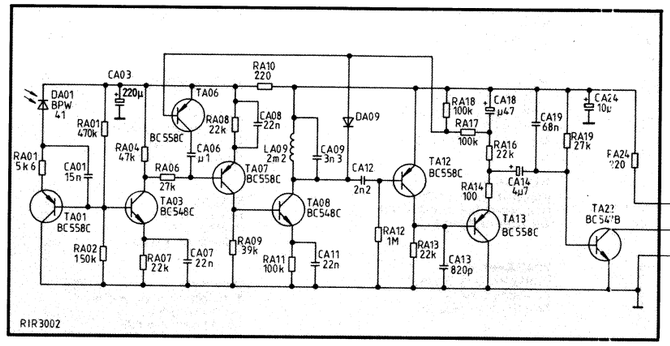



Power Supply Secondary
PCB 10
BP04 2pol
12.5V
Basic Board
PCB 01
B03 9pol
ON/ST-BY
7V
MUTING
13V
B02 5pol
13V
BRILLIANCE
CONTRAST
COLOUR
BS30
13V
Power Supply Secondary
PCB 10
Protection PCB11
BV07 2pol
AV-EXTERN 12V
B01 10pol
PLL-ENABLE
PLL-DATA
PLL-CLOCK
AV TIME CONST.
30V
116V
12V
TR67 BC636 12,5V
TR76 BC558
TR78 BC558
TR74 BC548C
TR68 BC548C
TR71 12,5V BC558
TR81 BC548
TR24 BC548
TR31 BC548
TR32 BC548
TR51 BC558
TR29 BC548
DR44 7.5V
5,6V
1,1V
0,55V
11,7V
10,8V
1.9V
3.6V
2.7V
2.9V

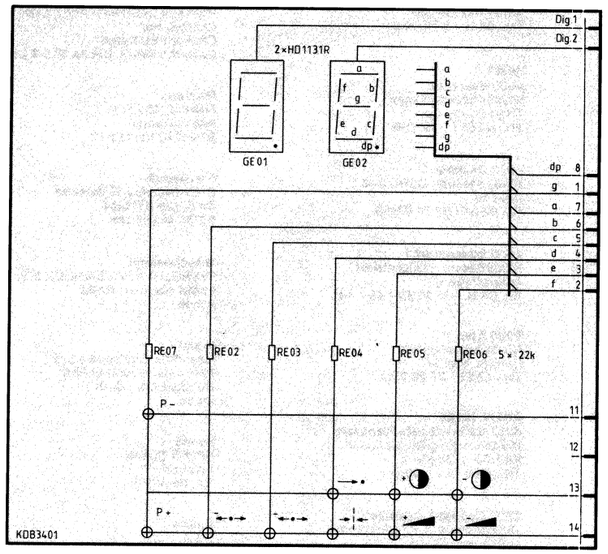
Netzschalter
Mains switch 473.804.6
Interruttore di rete



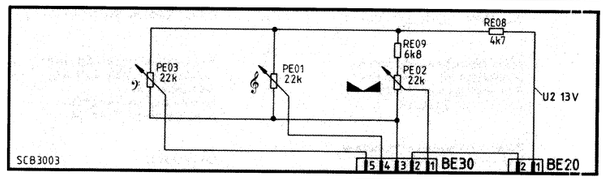
Infrarot-Vorverstärker
Infra-red pre-amplifier
Preamplificatore infra
583.521



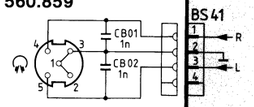
Bedienteilplatte
Control unit board
Piastra sezione comandi



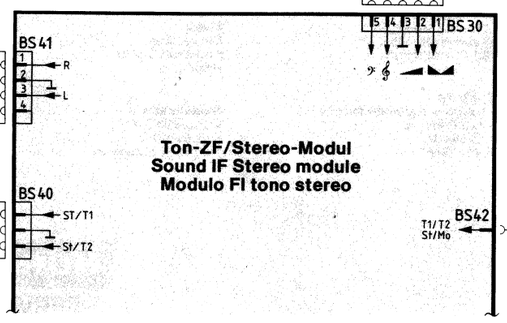
Reglerplatte
P.C.B., regulators
Piastra regolatori
592.721



Kopfhörerbuchse
Headphone socket
Presa per cuffia
560.859

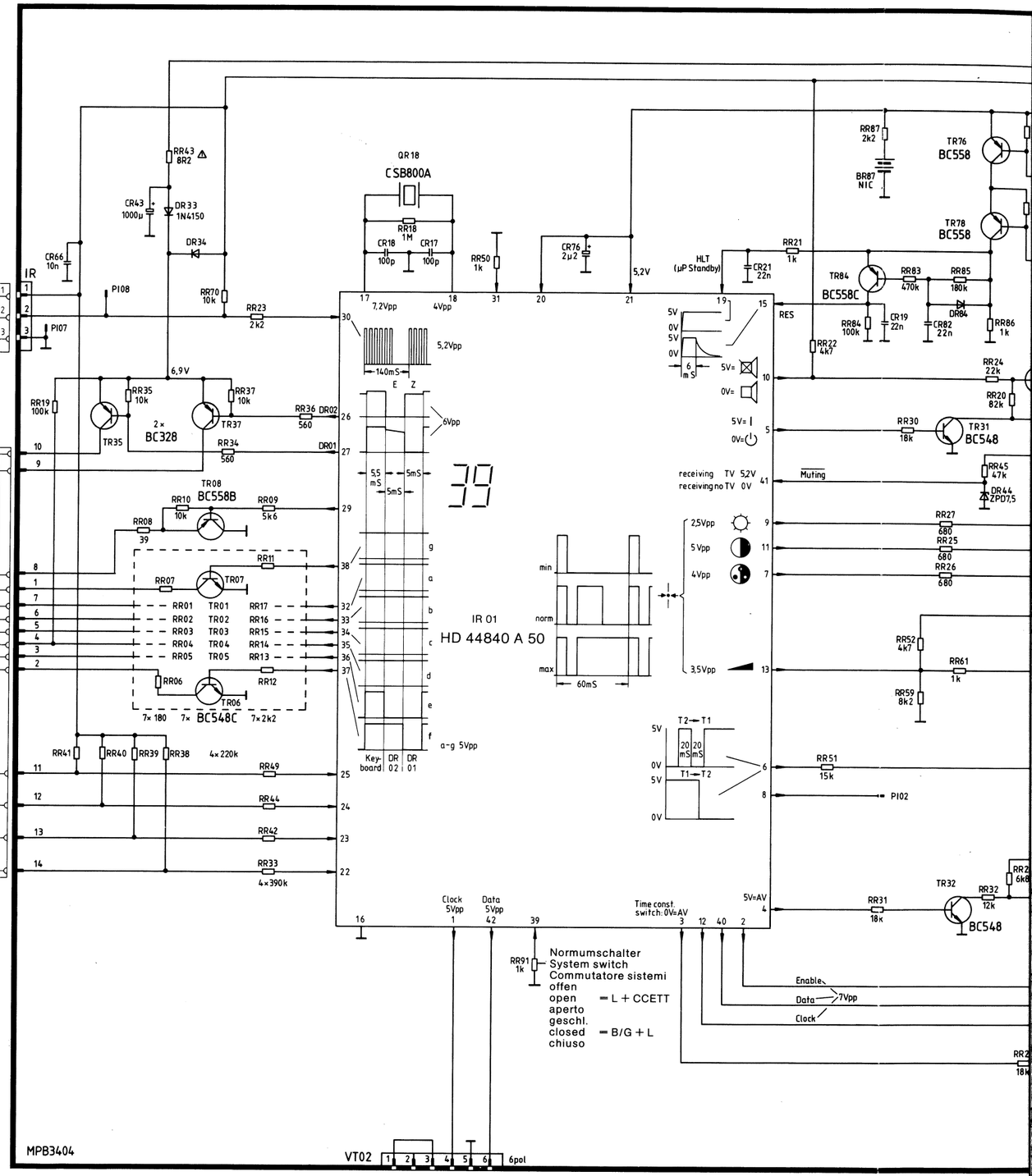


Anzeigeplatte
P.C.B. indicator
Piastra indicatore



Ton-ZF/Stereo-Modul
Sound IF Stereo module
Modulo FI tono stereo

Systemplatte CC 5
System board CC 5 592.718
Piastra sistema CC 5



zum Videotext-Nachrüstsatz
to Teletext retrofit set
verso corredo Televideo

Normumschalter
System switch
Commutatore sistemi
offen
open
aperto
geschl.
closed
chiuso
= L + CCETT
= B/G + L

Systemplatte CC 5
System board CC 5 **592.718**
Piastra sistema CC 5

4.6

zum Netzteil
to power unit
verso sezione di rete

MPB3404

IR 01
HD 44840 A 50

Normumschalter
System switch
Commutatore sistemi
offen
open aperto geschl. closed chiuso = L + CCETT
= B/G + L

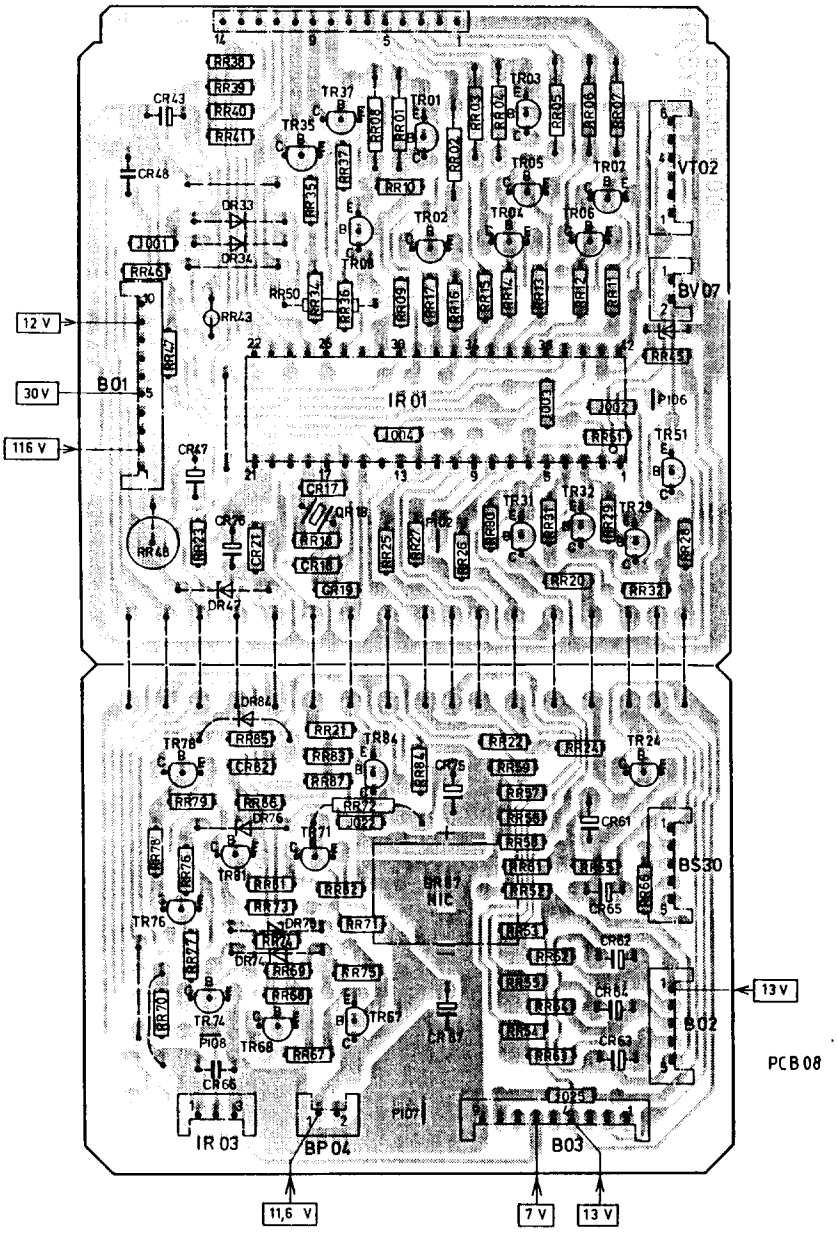
zum Videotext-Nachrüstsatz
to Teletext retrofit set
verso corredo Televideo

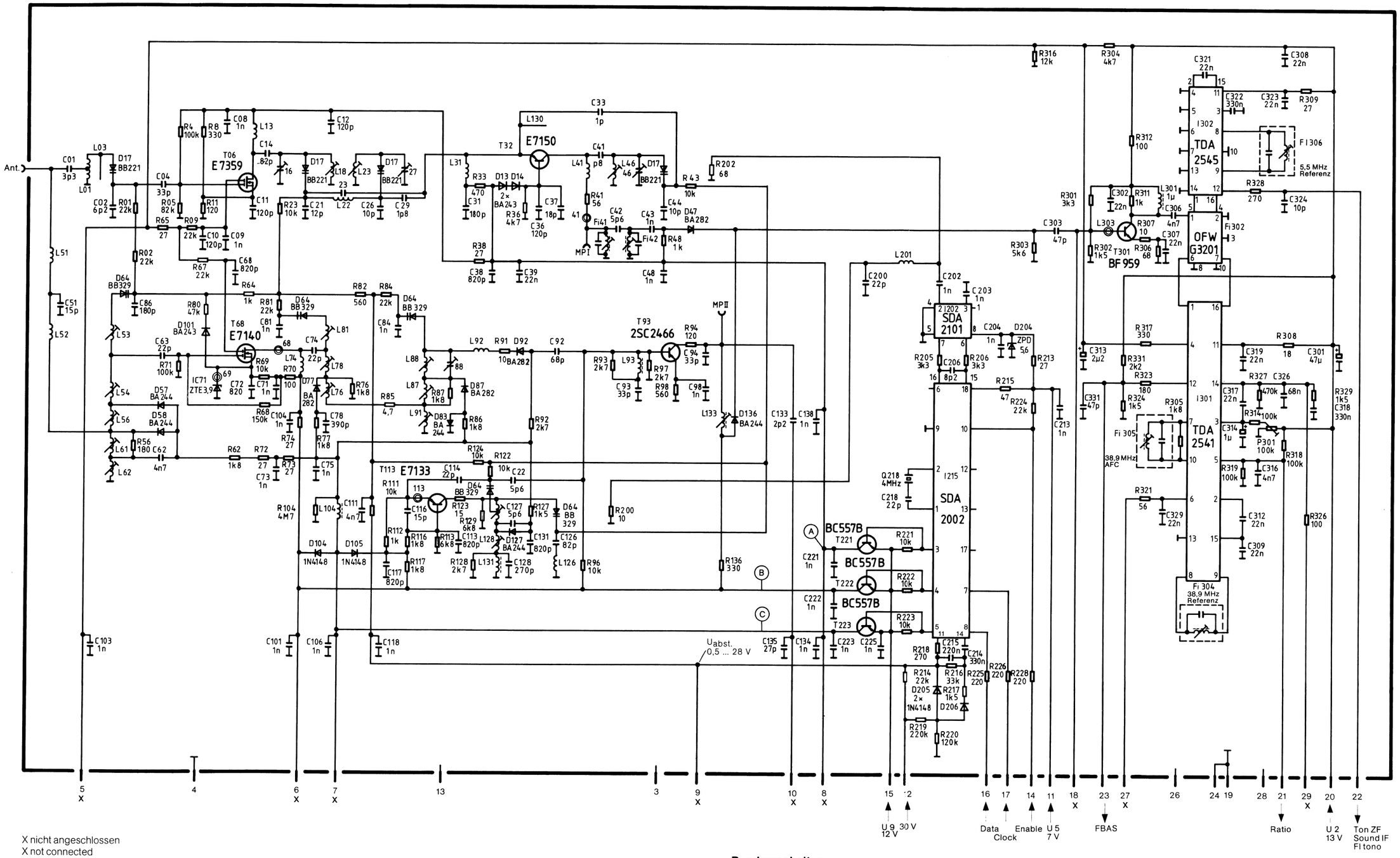
Netzteil
Power unit
Sezione di rete

Grundplatte
Basic p.c.b.
Piastra di base

Grundplatte
Basic p.c.b.
Piastra di base

System Board PCB08

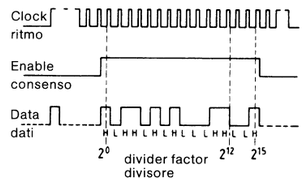


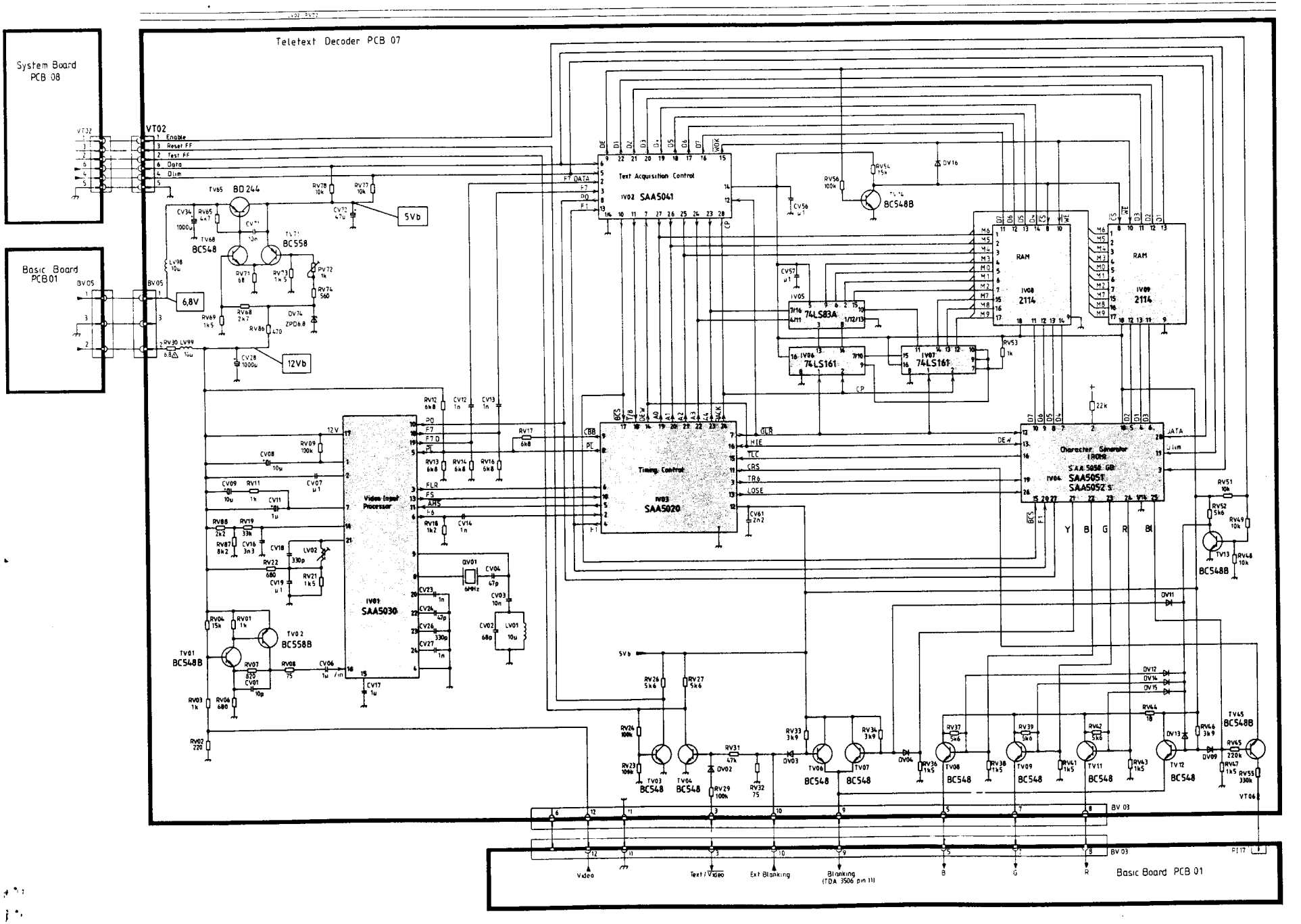


X nicht angeschlossen
X not connected
X non collegate

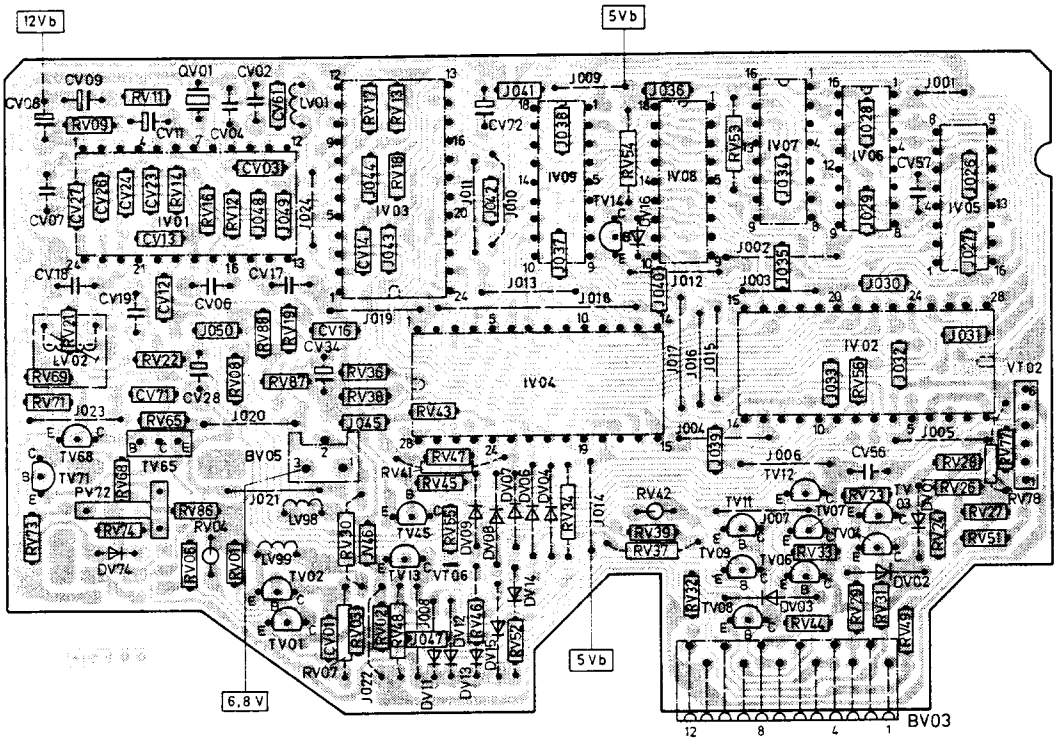
Bandumschaltung
Band switch
Commutazione di banda

A	B	C	
L	H	L	Band I
L	H	H	Band III
H	L	L	Band IV/V

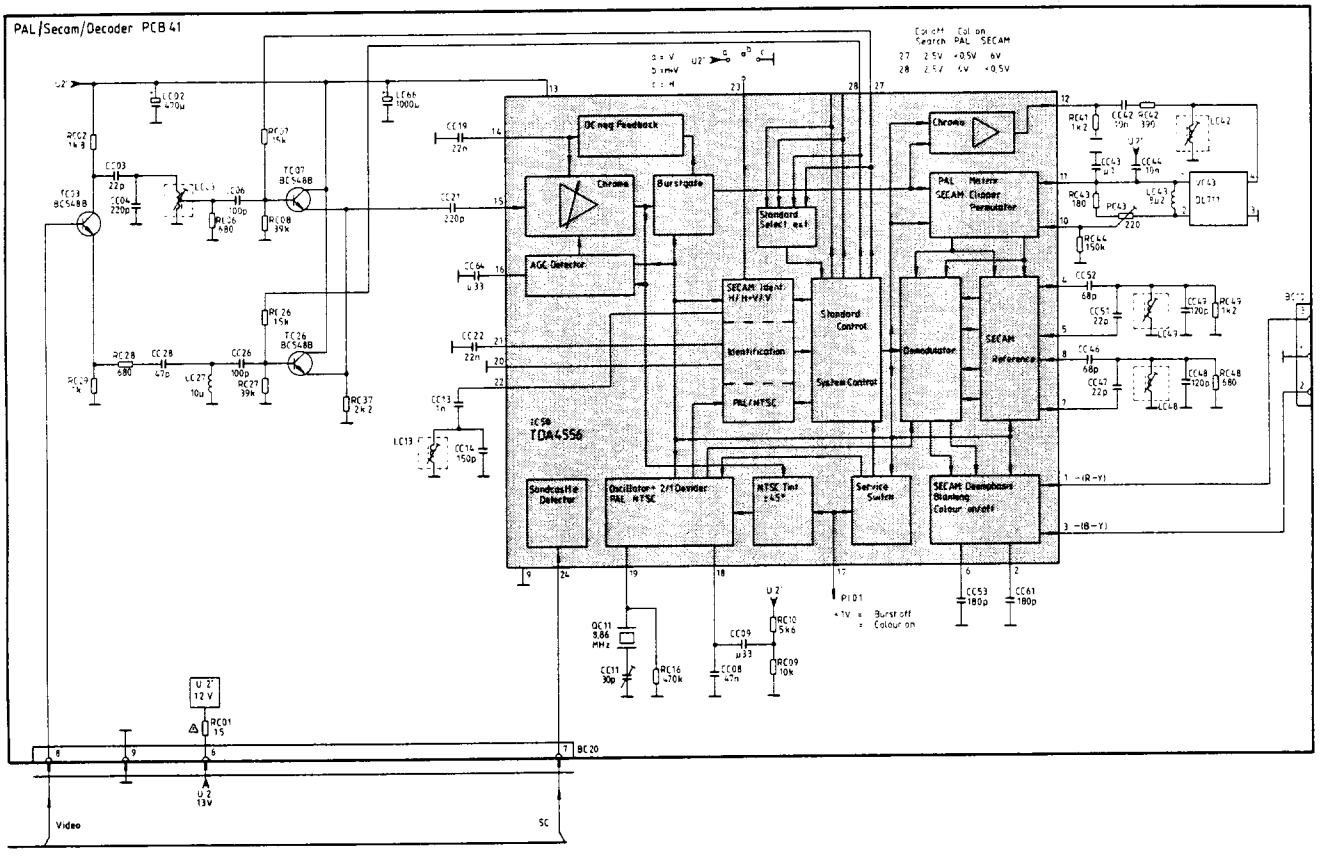



Teletext Decoder PCB 07
System Board PCB 08
Basic Board PCB01
VT02
1 Enable
3 Reset FF
2 Test FF
6 Data
4 Dim
5
BV05
6,8V
12Vb
5Vb
IV02 SAA5041
Text Acquisition Control
IV03 SAA5020
Timing Control
IV01 SAA5030
Video Input Processor
IV04 SAA5051 SAA5052
Character Generator
IV08 2114
IV09 2114
RAM
74LS83A
74LS161
BC548
BC548B
BC558
BD244
ZPD6.8
6MHz
Y B G R Bl
Video
Text / Video
Ext Blanking
Blanking (TDA 3506 pin 11)
Basic Board PCB 01

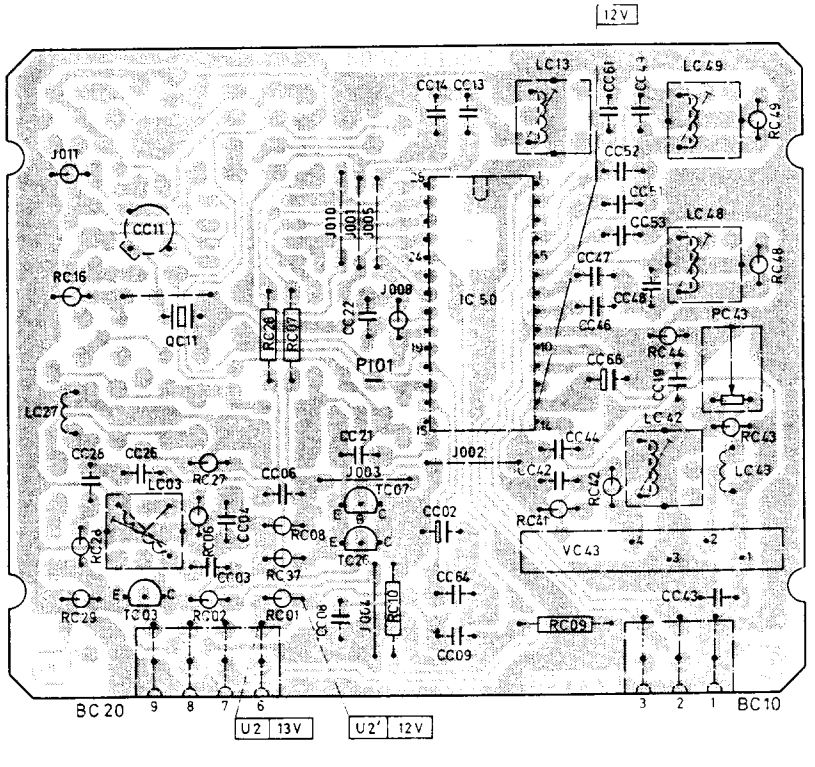
Teletext Decoder PCB07

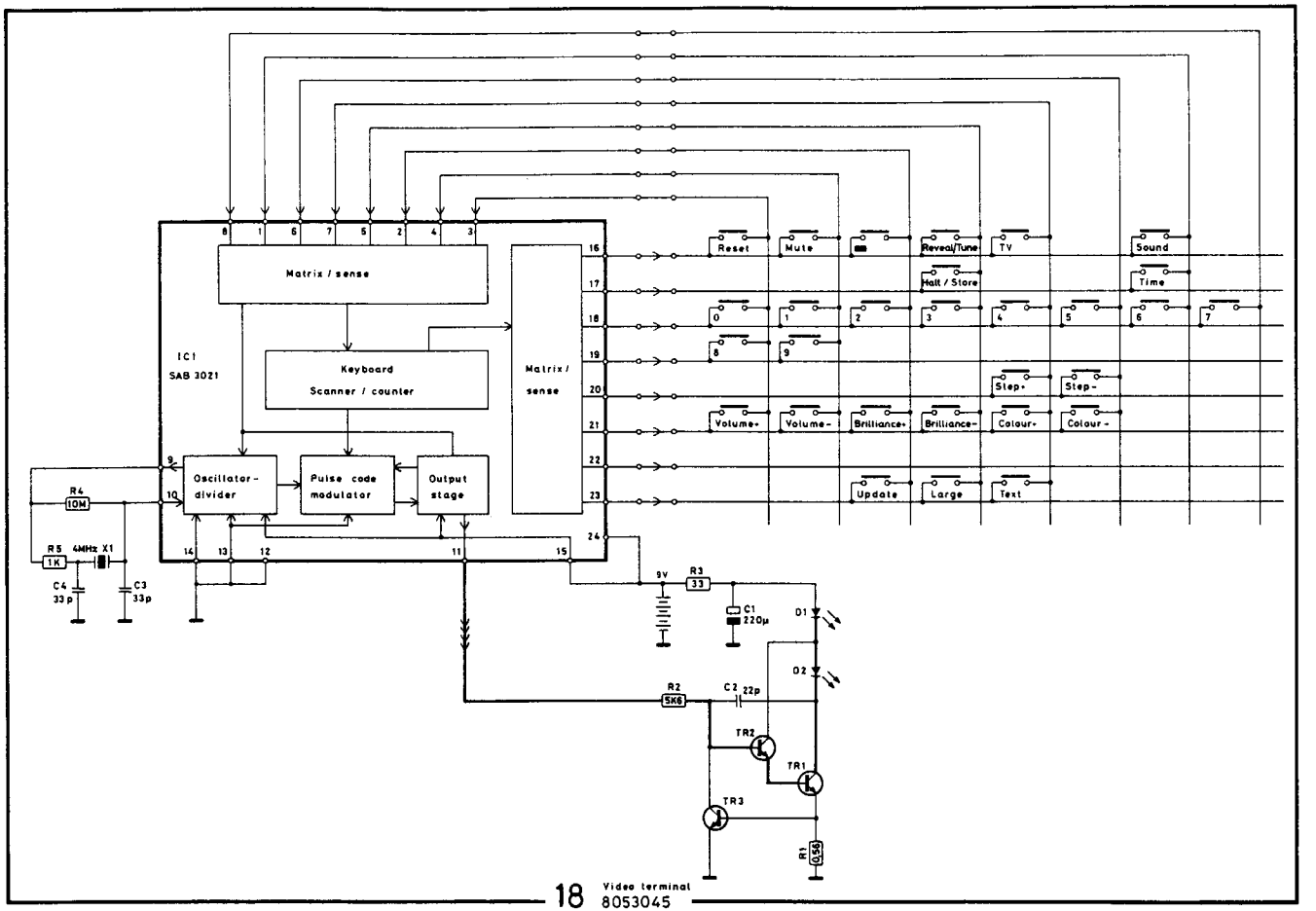


PAL/Secam Decoder PCB41



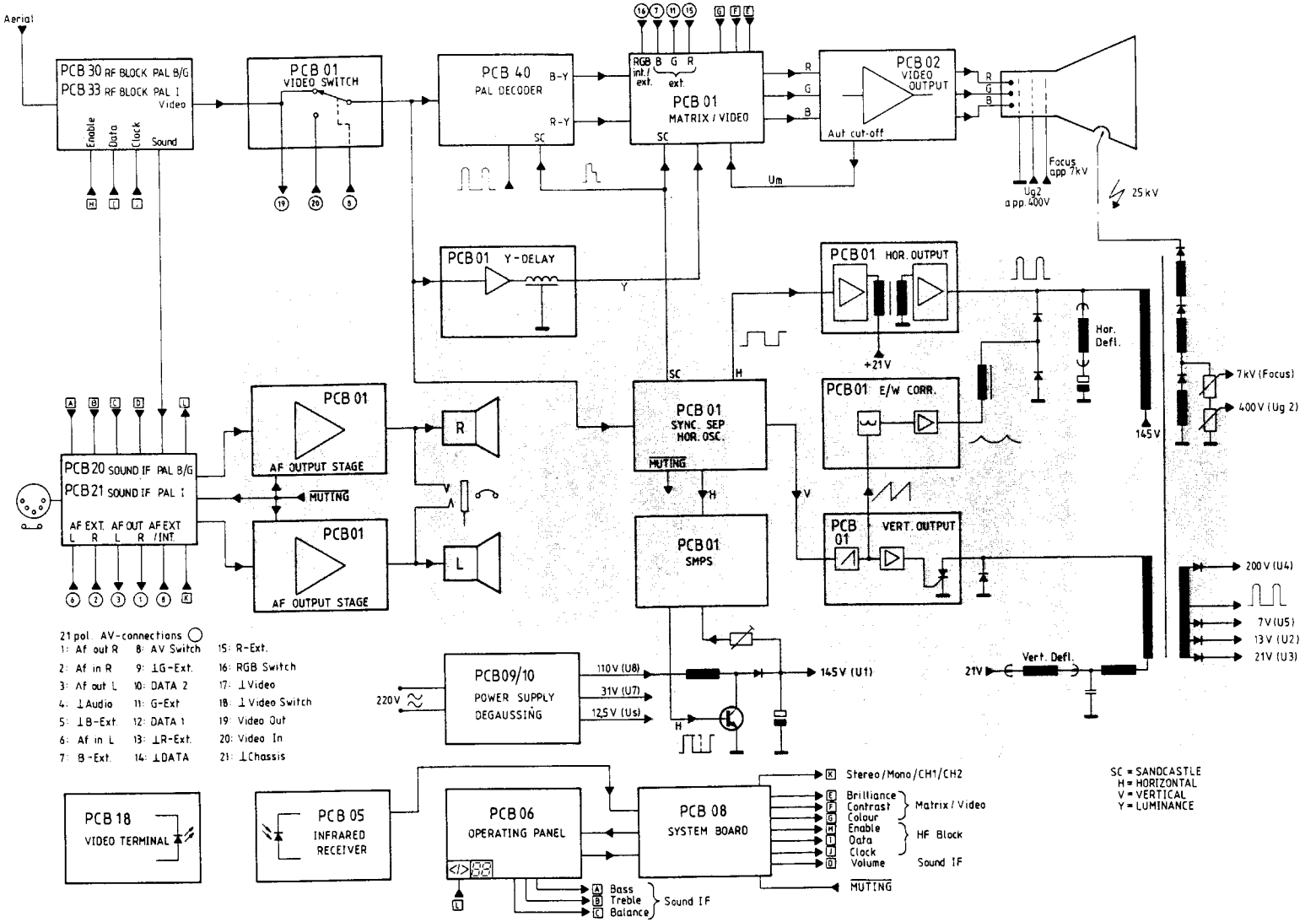
PAL/Secam Decoder PCB41





18 Video terminal 8053045

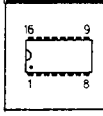
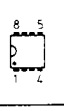
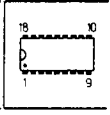
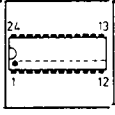
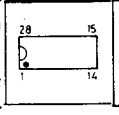
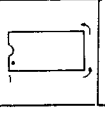
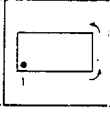
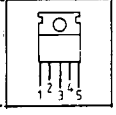
Blockdiagram



Bang&Olufsen

SURVEY OF SEMI-CONDUCTORS

IC LIST

101	103	111	113	125	136	138	143
							

01IG01	8340764	**103**	TDA 4950
01IL01	8340765	**125**	TEA 2026
01IS01	8340788	**143**	TDA 2030
01IS11	8340788	**143**	TDA 2030
01IV02	8340766	**125**	TDA 3506
01IV03	8340767	**103**	TEA 2014
07IV01	8340267	**113**	SAA 5030
07IV02△	8340268	**125**	SAA 5041
07IV03△	8340266	**113**	SAA 5020
07IV04△	8340269	**125**	SAA 5050 (GB character)
	8340270	**125**	SAA 5051 (D character)
	8340271	**125**	SAA 5052 (S character)
07IV05	8340273	**136**	74LS83
07IV06	8340272	**136**	74LS161
07IV07	8340272	**136**	74LS161
07IV08	8340277	**136**	2114
07IV09	8340277	**136**	2114
08IR01	8340785	**138**	HD 44840 A51
18IC01	8340342	**113**	SAB 3021
20ID01	8340498	**111**	TDA 2795
21ID01			
20ID26	8340769	**136**	U 829 B
21ID26			
20ID35	8340769	**136**	U 829 B
21ID35			
20ID51	8340771	**136**	TDA 4941
21ID51			
20IS03	8340048	**103**	SFC 2458 DC
21IS03		**103**	MC 1458 CP1
20IS04△	8340602	**101**	HCF 4052 BE
21IS04△		**101**	MC 14052 BCP
20IS06	8340772	**136**	MC 3403 DP
21IS06		**136**	MC 3303 P
20IS07△	8340602	**101**	HCF 4052 BE
21IS07△		**101**	MC 14052 BCP
20IS08	8340773	**136**	TA 7630 P
21IS08			
40IC01	8340768	**136**	AN 5620X
		136	TDA 5620
41IC50	8340786	**136**	TDA 4556

△ Statisk elektricitet kan ødelægge komponenten.
△ Static electricity may destroy the component.
△ Statische Elektrizität die Komponente zerstören kann.

TRANSISTOR LIST

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			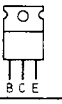	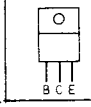	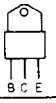	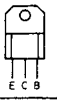	

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01TL02	8320038	**39**	BU 508A	07TV71	8320104 **20** BC 558B
01TL41	8320108	**20**	BC 548B	08TR01-	8320285 **20** BC 548C
01TL61				08TR07	
01TP01	8320624	**35**	BU 806	08TR08	8320104 **20** BC 558B
01TP21	8320629	**18**	BC 328-40	08TR24	8320108 **20** BC 548B
01TS01	8320097	**20**	BC 547B	08TR29	8320285 **20** BC 548C
01TV01				08TR31	
				08TR32	
02TV50	8320546	**17**	BF 422		
				08TR35	8320629 **18** BC 328-40
02TV51	8320623	**17**	BF 423	08TR37	
02TV52	8320630	**44**	BF 787	08TR51	8320104 **20** BC 558B
02TV60	8320546	**17**	BF 422	08TR67	8320632 **17** BC 636
02TV61	8320623	**17**	BF 423	08TR68	8320285 **20** BC 548C
02TV62	8320630	**44**	BF 787	08TR71	8320104 **20** BC 558B
02TV70	8320546	**17**	BF 422	08TR74	8320285 **20** BC 548B
02TV71	8320623	**17**	BF 423	08TR76	8320104 **20** BC 558B
				08TR78	
02TV72	8320630	**44**	BF 787		
				08TR81	8320108 **20** BC 548B
02TV81	8320152	**20**	BC 557B	08TR84	8320398 **20** BC 558C
07TV01	8320108	**20**	BC 548B	10TP101	8320097 **20** BC 547B
07TV02	8320104	**20**	BC 558B	11TR100	8320097 **20** BC 547B
07TV03	8320108	**20**	BC 548B	11TR101	
07TV04					
				11TR102	8320104 **20** BC 558B
07TV06-	8320108	**20**	BC 548B		
07TV09				18TR1	8320424 **17** BC 368
07TV11-	8320108	**20**	BC 548B	18TR2	8320108 **20** BC 548B
07TV14				18TR3	
07TV45	8320108	**20**	BC 548B	20TS32	8320237 **20** BC 546B
				21TS32	
07TV65	8320633	**33**	BD 244		

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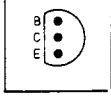		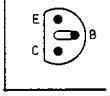	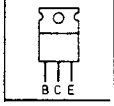	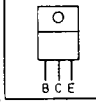	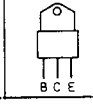	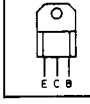	

20TS34- 8320237 **20** BC 546B
20TS36
21TS34-
21TS36

20TS41- 8320237 **20** BC 546B
20TS43
21TS41-
21TS43

20TS49 8320237 **20** BC 546B
21TS49

20TS52 8320237 **20** BC 546B
21TS52

41TC03 8320108 **20** BC 548B
41TC07
41TC26

DIODE LIST

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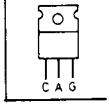
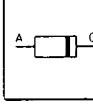
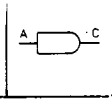
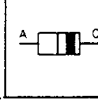
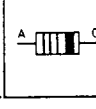
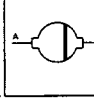
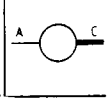
							

01DF03 8300051 **214** BAX 13
01DF05

01DF08 8300488 **202** ESM 740

01DF09 8300390 **212** BA 157

01DF25 8300350 **209** ZPD 36V

01DG01 8300058 **209** 1N 4148

01DG05 8300304 **221** BY 228

01DG06 8300491 **221** BY 298

01DL18 8300390 **212** BA 157
01DL20
01DL22

01DL23 8300492 **209** BY 296

01DL24 8300493 **221** BY 297

01DL76 8300058 **209** 1N 4148

01DP03 8300317 **209** 1N 4001

01DP10 8300390 **212** BA 157

01DP13 8300317 **209** 1N 4001

01DP14 8300493 **221** BY 297

01DP15 8300317 **209** 1N 4001

01DP18- 8300058 **209** 1N 4148
01DP20

01DP21 8300317 **209** 1N 4001

01DP22 8300058 **209** 1N 4148

01DP23 8300317 **209** 1N 4001
01DP24

01DP43 8300058 **209** 1N 4148
01DP44

01DV01 8300058 **209** 1N 4148
01DV02
01DV08
01DV80

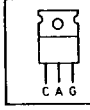
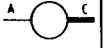
02DV50- 8300058 **209** 1N 4148
02DV52

02DV60- 8300058 **209** 1N 4148
02DV62

02DV70- 8300058 **209** 1N 4148
02DV72

06DR01 8330131 Display
06DR02

06DR03- 8330135 **241** LED red
06DR05

202	209	212	214	215	221	241	
							

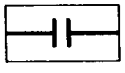
07DV02-	8300058	**209**	1N 4148
07DV04			
07DV09	8300058	**209**	1N 4148
07DV11-	8300058	**209**	1N 4148
07DV16			
07DV74	8300154	**209**	ZPD 6.8V
08DR33	8300498	**215**	1N 4150
08DR34	8300058	**209**	1N 4148
08DR44	8300496	**209**	ZPD 7.5V
08DR47	8300210	**209**	ZPD 30V
08DR74	8300058	**209**	1N 4148
08DR75	8300169	**209**	ZPD 5.1V
08DR76	8300058	**209**	1N 4148
08DR84			
10DP42	8300466		B125 C1500
10DP45	8300058	**209**	1N 4148

10DP46	8300466		B125 C1500
10DP100-	8300102	**209**	1N 4004
10DP103			
11DR100	8300058	**209**	1N 4148
20DD28	8300058	**209**	1N 4148
21DD28			
20DD38	8300058	**209**	1N 4148
21DD38			
20DD56	8300058	**209**	1N 4148
21DD56			
20DS31	8300058	**209**	1N 4148
21DS31			
20DS32	8300058	**209**	1N 4148
21DS32			
20DS62	8300201	**209**	ZPD 6.2V
21DS62			
40DC04	8300058	**209**	1N 4148

ELECTRICAL PARTS LIST

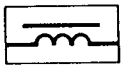
PCB01, 8053178 Basic Board PAL B/G
PCB01, 8053187 Basic Board PAL I

RF10	5020141	4.75 kΩ 1% 1/4W	RP10	5020752	1.2 Ω 5% 0.3W
RF35	5020738	470 Ω 5% 0.3W	RP14	5020753	0.39 Ω 10% 0.5W
RL22	5020739	1 kΩ 10% 0.5W	RP31	5020754	27 Ω 5% 0.3W
RL27	5020740	0.22 Ω 10% 0.5W	RS08	5020755	1 Ω 5% 0.33W
RL28	5020741	1.5 Ω 10% 1W	RS18	5020755	1 Ω 5% 0.33W
RL29	5011212	0.82 Ω 10% 2W	RV23	5020756	10 Ω 5% 0.3W
RL49	5020742	3.3 kΩ 1% 0.4W	RV86	5020757	47 Ω 5% 0.3W
RL50	5020743	100 Ω 5% 4W	PF02	5370306	47 Ω 20%
RL51	5020744	39 Ω 5% 0.33W	PF04	5370307	10 kΩ 20%
RL52	5020745	15 Ω 5% 0.3W	PG01	5370308	2.2 kΩ 20%
RL53	5020746	100 Ω 5% 0.33W	PG02	5370309	22 kΩ 20%
RL54	5020737	1 Ω 5% 0.5W	PG03	5370310	100 kΩ 20%
RL64	5020747	750 kΩ 1% 0.4W	PL01	5370307	10 kΩ 20%
RL65	5020748	1.5 MΩ 2% 0.4W	PP01	5370311	470 Ω 20%
RL67	5020749	30.1 kΩ 1% 0.4W	PV03	5370307	10 kΩ 20%
RL71	5020750	475 Ω 1% 0.4W	PV04	5370307	10 kΩ 20%
RL72	5020750	475 Ω 1% 0.4W	PV06	5370307	10 kΩ 20%
RP03	5020751	0.33 Ω 10% 4W			



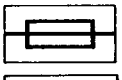
CG05	4200619	1 µF 250V	CL25	4200621	10 µF 250V
CG08	4100009	220 pF 1000V	CL28	4200622	1000 µF 40V
CL12	4100189	9600 pF 1500V	CL64*	4130345	560 nF 10% 63V
CL18	4200620	4.7 µF 160V	CP09	4200622	1000 µF 40V
CL19	4200620	4.7 µF 160V	CP11	4200623	470 µF 160V
CL24	4100252	0.1 µF 275V	CP14	4200624	100 µF 160V

* Specially selected or adapted sample.



LG01	8020570	Coil	LL02	6710013	Ferrite core
LG02	8020571	Coil	LL03	6710013	Ferrite core
LG03	6710012	Ferrite core	LL04	8020573	Coil 50 µH
LG04	6710012	Ferrite core	LL05	8020574	Coil 60 µH
LG06	6710012	Ferrite core	LL06	8020573	Coil 50 µH
LG07	6710012	Ferrite core	LP01	8020575	Coil
LL01	8020572	Coil	LP02	8020576	Coil 70 µH

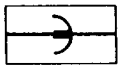
LV07	8030083	Filter 5.5 MHz
LV08	8030083	Filter 5.5 MHz
QL07	8030084	Filter 503 kHz ±2 kHz



FP02	6600022	Fuse T 1.6A 250V

UL01	8014079	Transformator
UL02	8014080	Transformator

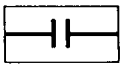
VV03	6240018	Delay line



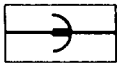
B001	7220458	Plug 10/10 pol.	BV02	7220454	Plug 6/6 pol.
B002	7220459	Plug 5/5 pol.	BV03	7220455	Plug 12/12 pol.
B003	7220460	Plug 9/9 pol.	BV05	7220453	Plug 3/3 pol.
B004	7220461	Plug 4/4 pol.	BV06	7210555	21 pol. plug
B010	7500013	Contact spear	BV07	7220443	Plug 2/2 pol.
B012	7500013	Contact spear	PI07	7500216	Solder pin
BC10	7220456	Plug 5/5 pol.	PI13	7500216	Solder pin
BC20	7220457	Plug 4/4 pol.	PI14	7500216	Solder pin
BF01	7500013	Contact spear	PI15	7500216	Solder pin
BL01	7500013	Contact spear	PI16	7500216	Solder pin
BS32	7220452	Plug 8/8 pol.	PI17	7500216	Solder pin
BS34	7220452	Plug 8/8 pol.	PI20	7500216	Solder pin
BV01	7220453	Plug 3/3 pol.	PI23	7500216	Solder pin

PCB02, 8003554 Video Output

RV51	5020758	1 kΩ 5% 0.33W	RV71	5020758	1 kΩ 1/4W
RV52	5020697	22 kΩ 5% 1W	RV72	5020697	22 kΩ 5% 1W
RV53	5020774	47 kΩ 5% 1W	RV73	5020774	47 kΩ 5% 1W
RV54	5011030	1.2 kΩ 5% 1/2W	RV74	5011030	1.2 kΩ 5% 1/2W
RV61	5020758	1 kΩ 5% 0.33W	RV94	5011030	1.2 kΩ 5% 1/2W
RV62	5020697	22 kΩ 5% 1W	PV50	5370312	220 kΩ 20%
RV63	5020774	47 kΩ 5% 1W	PV70	5370312	220 kΩ 20%
RV64	5011030	1.2 kΩ 5% 1/2W			



CV52	4000176	100 pF 5% 63V	CV82	4200626	33 µF 20% 250V
CV62	4000110	82 pF 5% 63V	CV90	4010165	10 nF 20% 2KV
CV72	4000019	68 pF 5% 63V	CV91	4100257	1 nF 10% 400V
CV81	4200129	100 µF -10+100% 16V			



BV01	7220388	Plug 3/3 pol.
BV02	7220442	Plug 6/6 pol.

	7500217	Clips f. connection
	7500202	Crimp contact
	7210536	Socket f. picture tube
	7210537	Socket f. focus
	3300107	Cover f. focus

PCB03, 8003541 Headphone Output

RB01	5010815	220 Ω 5% 1/2W
RB02	5010815	220 Ω 5% 1/2W

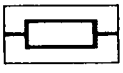
PCB04, 8003548 Speaker Output

	7220285	Plug 3/3 pol.

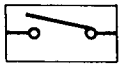
PCB05, 8003529 IR Receiver

IR Receiver is a single unit. With failure in this block we recommend replacing.

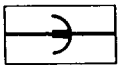
PCB06, 8003542 Operating Panel



RR05	5010983	750 Ω 5% 1/4W	PR01	5310118	22 kΩ Lin. 0.1W
RR06	5010983	750 Ω 5% 1/4W	PR02	5310118	22 kΩ Lin. 0.1W
RR07	5010983	750 Ω 5% 1/4W	PR03	5310118	22 kΩ Lin. 0.1W



S1	7400308	Switch
	7500148	Contact spring

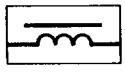


BR01	7220392	Plug 18/17 pol.
BS100	7220146	Plug 9/8 pol.
IR	7220214	Plug 3/3 pol.

PCB07, Teletext Decoder
8003557 S character
8003558 D character
8003559 GB character

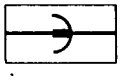
RV30	5020786	6.8 Ω 10% 0.35W
PV72	5370320	1 kΩ 20%

CV02	4000197	68 pF 5% 63V



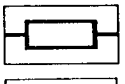
LV01	8022241	Coil 10 µH	LV98	8020582	Coil 10 µH
LV02	8020583	Coil	LV99	8020582	Coil 10 µH

QV01	8090009	Crystal 6 MHz

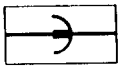


BV03	7210547	Socket/housing 12/12 pol.

PCB08, 8003544 System Board



RR43	5020787	8.2 Ω 5% 0.3W
QR18	8030089	Cer. res. 800 Hz



B01	7220467	Plug 10/10 pol.	IR03	7220462	Plug 3/3 pol.
B02	7220464	Plug 5/5 pol.	PI01	7500216	Solder pin
B03	7220463	Plug 9/9 pol.	PI02	7500216	Solder pin
BP04	7220444	Plug 2/2 pol.	PI06	7500216	Solder pin
BR02	7220468	Plug 14/14 pol.	PI07	7500216	Solder pin
BS30	7220464	Plug 5/5 pol.	PI08	7500216	Solder pin
BV07	7220444	Plug 2/2 pol.	VT02	7220466	Plug 6/6 pol.

BR87	8700018	Battery 2.4V

PCB09, 8003670 Power Supply Primary

RP41	5230009	PTC 40+100 Ω 265V
RP42	5011209	10 MΩ 5% 1/2W
CP41	4130100	68 nF 10% 250V
CP42	4130279	100 nF 20% 275V
UP40	8022191	Coil
FP42	6600022	Fuse 1.6A-T 250V
	7500002	Fuse holder
SP01	7600080	Relay 24V
BP01	7500013	Contact pin
BP02	7500080	Contact pin

PCB10, 8003671 Power Supply Secondary

RP43	5020684	0.47 Ω 0.4W			
RP44	5020551	220 Ω 0.3W			
CP43	4010141	4.7 nF 500V	CP49	4200526	2200 µF 50V
CP44	4010141	4.7 nF 500V	CP51	4010141	4.7 nF 500V
CP46	4010063	4.7 nF 10% 63V	CP53	4010063	4.7 nF 10% 63V
CP47	4010063	4.7 nF 10% 63V	CP54	4010063	4.7 nF 10% 63V
CP48	4010063	4.7 nF 10% 63V	CP56	4010063	4.7 nF 10% 63V
FP41	6600009	Fuse 2A-T 250V			
	7500002	Fuse holder			
BP03	7210477	Plug 5/5 pol.			
BP04	7220388	Plug 3/3 pol.			
UP41	8013342	Transformator 220V			

PCB11, 8003572 Protection Board

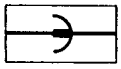
	7210476	Socket/housing 14 pol.
	7220286	Plug 7/7 pol.
	7220391	Plug 14/14 pol.

PCB18, 8003042 Video Terminal

R1	5020129	0.56 Ω 10% 1/2W			
R4	5010638	10 MΩ 5% 1/4W			
C1	4200396	220 µF 16V	C3	4000186	33 pF 5% 63V
C2	4000185	22 pF 5% 63V	C4	4000186	33 pF 5% 63V
X1	8030000	Cer. res. 4 MHz			
P33	7210290	Socket/housing 8/8 pol.		7500154	Contact pin
				7500148	Contact spring
P34	7210289	Socket/housing 7/7 pol.			

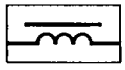
PCB20, 8003662 Sound PAL B/G

RD04	5020760	33 Ω 5% 0.3W	PD12	5370314	100 Ω 20%
RD33	5020760	33 Ω 5% 0.3W	PD16	5370314	100 Ω 20%
RS10	5020760	33 Ω 5% 0.3W	PD51	5370315	22 kΩ 20%
CD26	4100249	680 pF 2.5% 63V			
CD35	4100249	680 pF 2.5% 63V			
LD16	8022244	Coil 54.687kHz			
LD24	8022245	Filter 5.62MHz			
LD35	8022245	Filter 5.62MHz			
QD28	8030085	Filter 5.742MHz			
QD41	8030086	Filter 5.5MHz			



BS01	7210541	Socket/housing 15/9 pol.	BS31	7210540	Socket 5 pol. DIN
BS02	7210542	Socket/housing 11/5 pol.			

PCB21, 8003667 Sound PAL I



CD40	4100249	680 pF 2.5% 63V			

LD40	8022247	Filter 6MHz			

QD40	8030091	Filter 6MHz			

Other parts as for PCB20, 8003662 Sound PAL B/G

PCB30, 8053034 RF Block PAL B/G

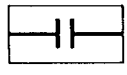
RF Block PAL B/G is a single unit.
With failure in this block we recommend replacing.

PCB33, 8053188 RF Block PAL I

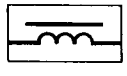
RF Block PAL I is a single unit.
With failure in this block we recommend replacing.

PCB40, 8003661 PAL Decoder

RC08	5020754	27 Ω			
PC01	5370313	2.2 kΩ 20%			

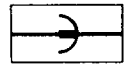


CC14	4340026	4 - 40 pF			



LC02	8022241	Coil 10 µH	LC05	8022243	Filter 4.43MHz
LC03	8022242	Coil 120 µH	LC06	8022241	Coil 10 µH
LC04	8022242	Coil 120 µH			
VC01	6240019	Delay line			

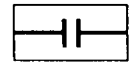
QC02	8090046	Crystal 4.43MHz			



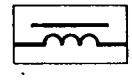
BC10	7210539	Socket/housing 5/5 pol.	BC20	7210538	Socket/housing 4/4 pol.

PCB41, 8003659 PAL/SECAM Decoder

RC01	5020723	15 Ω 5% 0.3W			
PC43	5370321	220 Ω			

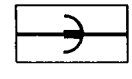


CC11	4340026	4-40 pF			



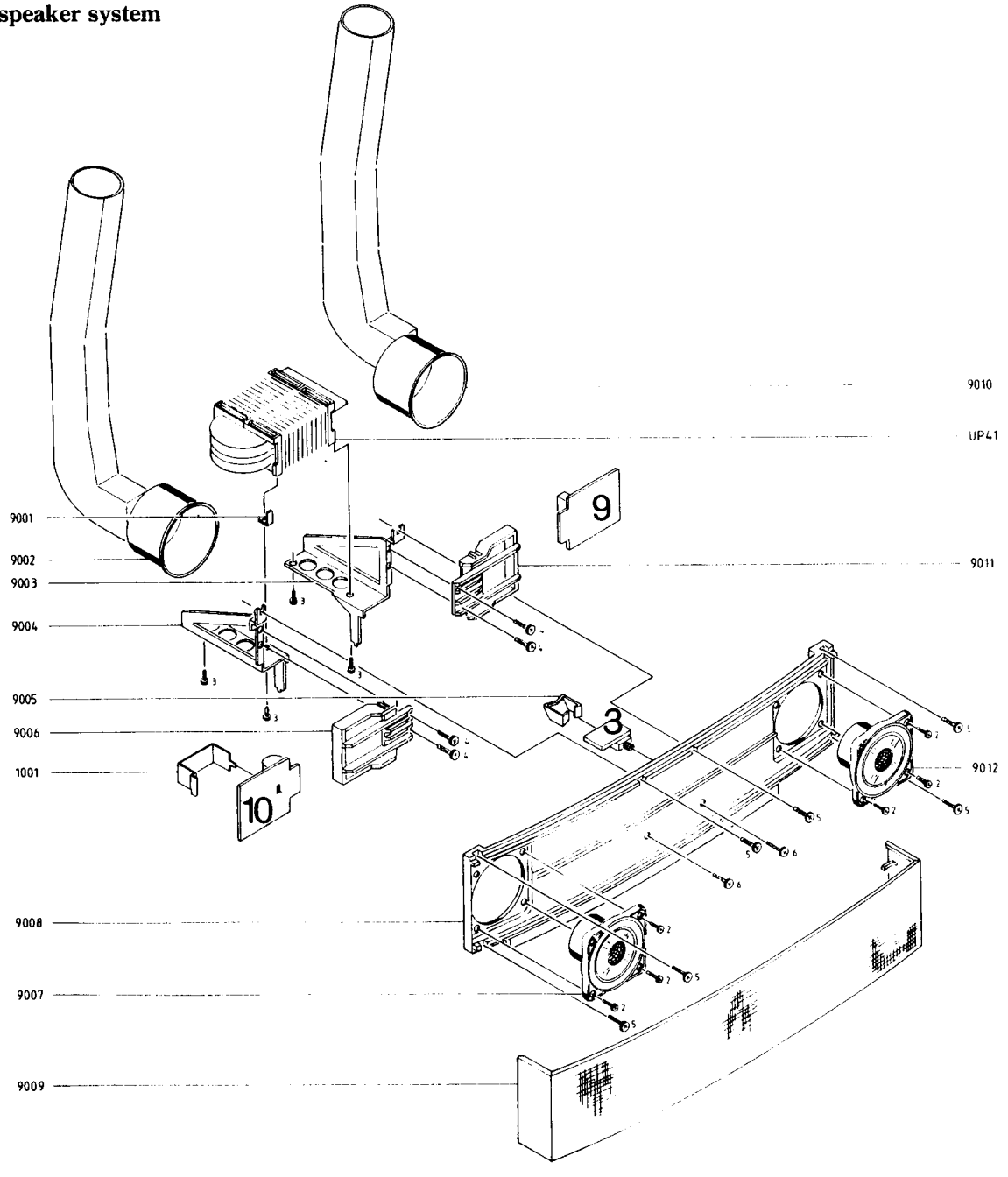
LC03	8020585	Filter 4.43 MHz	LC43	8020584	Coil 8.2 µH
LC13	8020586	Filter 4.43 MHz	LC48	8020587	Filter 4.43 MHz
LC27	8022241	Coil 10 µH	LC49	8020587	Filter 4.43 MHz
LC42	8022243	Filter 4.43 MHz			

QC11	8090049	Crystal 8.8 MHz			
VC43	6240019	Delay line SDL145			



BC10	7210548	Socket/housing 3/3 pol.	BC20	7210549	Socket/housing 4/4 pol.

MECHANICAL PARTS LIST
Loudspeaker system

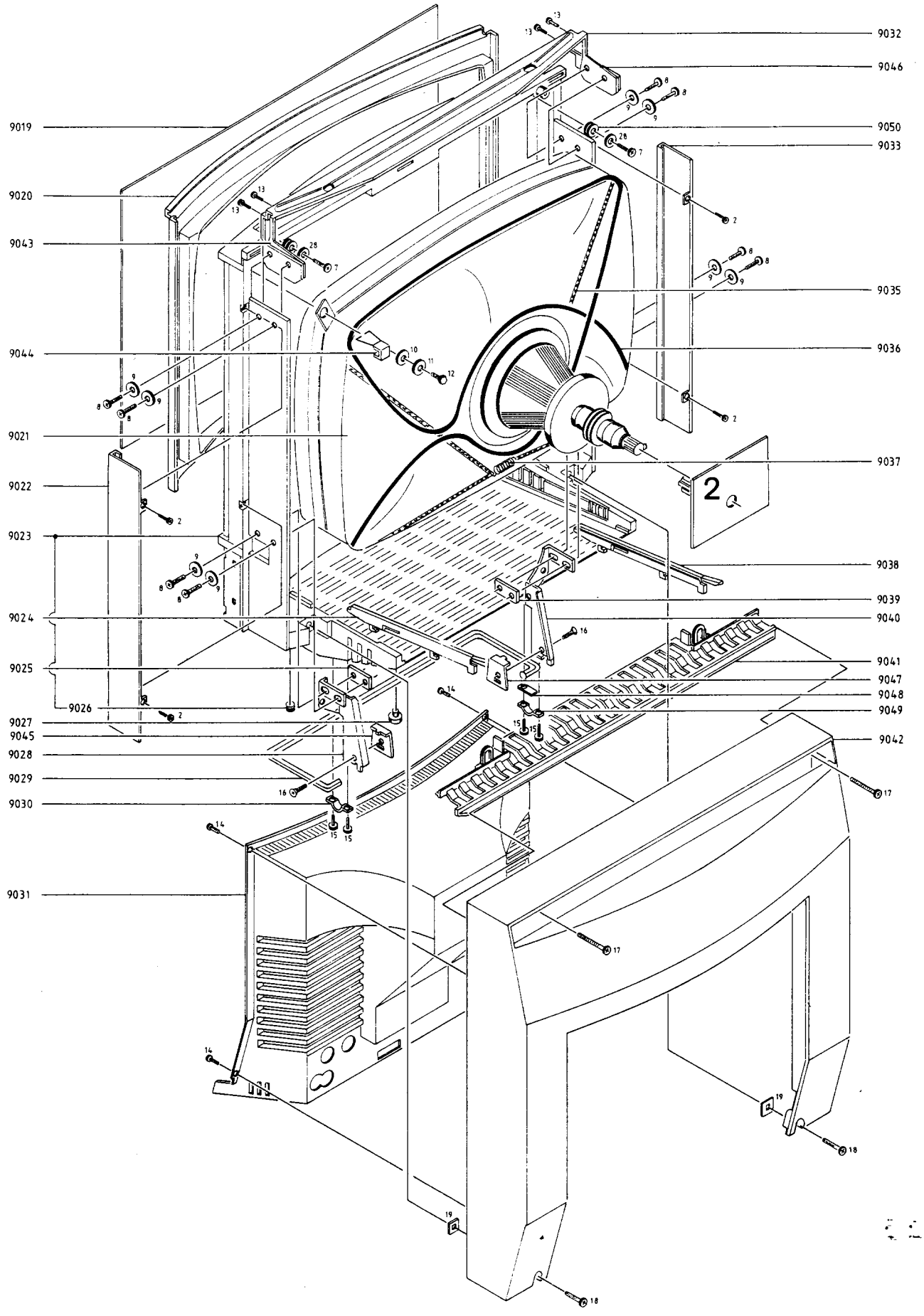


9001	7500145	Spade plug	9008	3440081	Loudspeaker baffle
9002	3132096	Loudspeaker damping tube, left	9009	3450557	Loudspeaker panel
	3989014	Damping cotton	9010	3132095	Loudspeaker damping tube, right
9003	2530478	Bracket, right		3989014	Damping cotton
9004	2530464	Bracket, left	9011	3151000	Holder
9005	2510153	Clips	9012	8480164	Loudspeaker 3"
9006	3151000	Holder	UP41	8013342	Main transformer
9007	8480164	Loudspeaker 3"			

03Modul	8003541	PCB03, Headphone Output			
09Modul	8003670	PCB09, Power Supply Primary			
10Modul	8003671	PCB10, Power Supply Secondary	1001	3302401	Screen for diodes

Bang&Olufsen

Cabinet



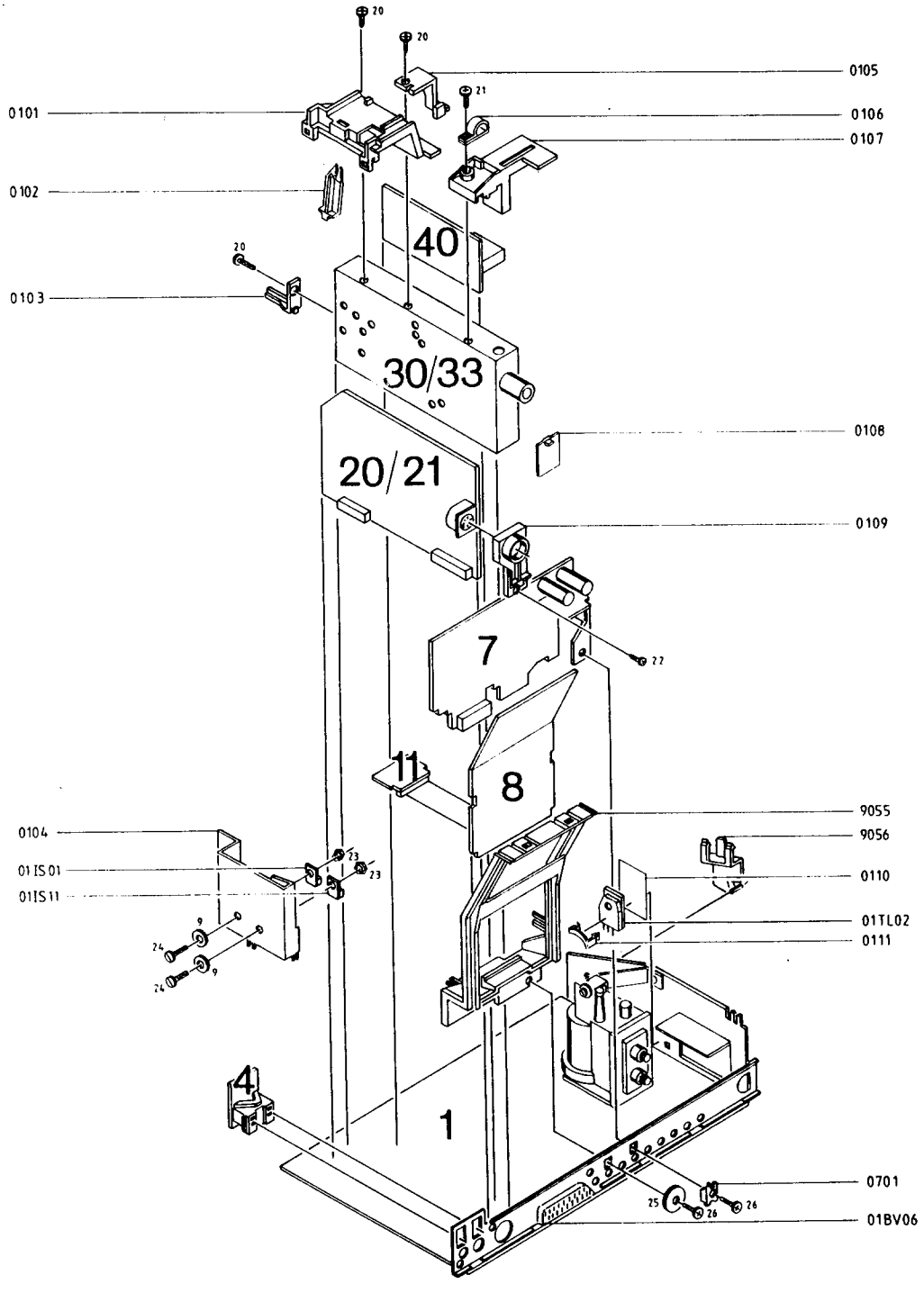
Cabinet

9019	3450563	Contrast screen f. MX2000
9020	3320072	Front frame f. M20
	3320088	Front frame f.MX2000
	3950020	Rubber string ø3
9021*	8200052	Picture tube
9022	3470157	Side plate f. M20
	3470130	Side plate f. MX2000
	3950021	Rubber string ø4
	3950014	Foam profile
9023	3320079	Bottom/front part f. M20
	3320085	Bottom/front part f. MX2000
9024	3151222	Guide rail
9025	2642026	Retaining plate
9026	2389051	Drive fit nut
9027	3035026	Rubber foot
9028	2530429	Bracket, right
9029	3103193	Tilting foot
9030	2641114	Fittings
9031	3430325	Back cover
	3911013	Cloth
9032	2530427	Carrying handle
9033	3470157	Side plate f. M20
	3470130	Side plate f. MX2000
	3950021	Rubber string ø 4
	3950014	Foam profile
9035	7510004	Ground current
9036	8022190	Degaussing coil
9037	2810071	Spring
9038	3151222	Guide rail
9039	2642026	Retaining plate
9040	2530428	Bracket, left
9041	3444000	Grill
9042	3430262	Back cover, cabinet f. M20 grey
	3414914	Back cover, cabinet f. MX2000 red
	3414915	Back cover, cabinet f. MX2000 white
	3414916	Back cover, cabinet f. MX2000 black
	3414917	Back cover, cabinet f. MX2000 grey metallic
9043	2530483	Bracket for handle, right
9044	2514057	Hook f. Video Colore picture tube
	2514058	Hook f. Toshiba picture tube
9045	2642027	Retaining plate
9046	2530505	Bracket for handle, left
9047	2642027	Retaining plate
9048	2819160	Bronze spring
9049	2641114	Fittings
9050	2938243	Rubber bushing

02Modul	8003554	PCB02, Video Output
	3300107	Cover f. focus

* Specially selected

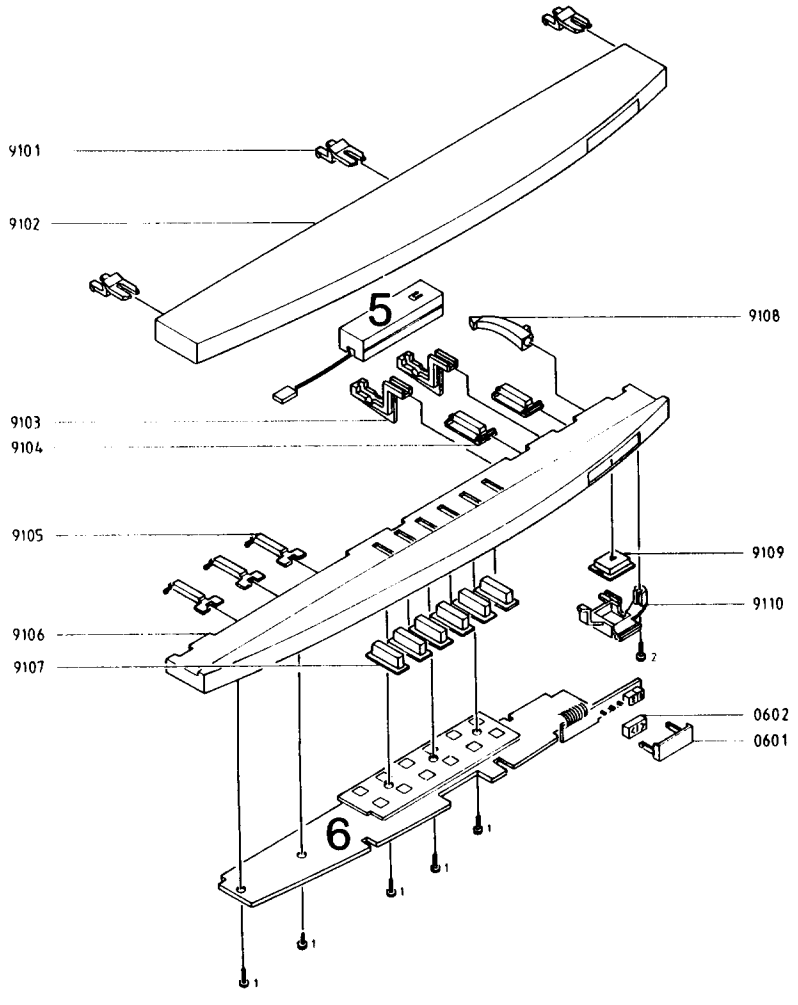
EL-Chassis


0101
0102
0103
0104
01IS01
01IS11
0105
0106
0107
0108
0109
0110
01TL02
0111
9055
9056
0701
01BV06
40
30/33
20/21
7
8
11
4
1

EL-Chassis

9055	3152408	Holder
9056	3152437	Cable binder
01Modul	8053178	Basic Board PAL B/G
	8053187	Basic Board PAL I
0101	3152494	Holder
0102	3152495	Pin for holder
0103	3152498	Chassis holder
0104	3358212	Heatsink
0105	3152496	Module holder
0106	2515004	Cable binder
0108	2576184	Insulating piece
0109	3152497	Holder
0110	2622393	Insulating piece
0111	2816216	Clips
01BV06	7210555	21 pol.
01IS01	8340788	TDA 2030
01IS11	8340788	TDA 2030
01TL02	8320038	BU 508A
04Modul	8003548	PCB04, Speaker Output
07Modul	8003557	PCB07, Teletext S character
	8003558	PCB07, Teletext D character
	8003559	PCB07, Teletext GB character
0701	2640045	Clamp
0702	3152493	Module holder
08Modul	8003544	PCB08, System Board
11Modul	8003572	PCB11, Protection Board
20Modul	8003662	PCB20, Sound PAL B/G
21Modul	8003667	PCB21, Sound PAL I
30Modul	8053034	PCB30, RF Block PAL B/G
33Modul	8053188	PCB33, RF Block PAL I
40Modul	8003661	PCB40, PAL Decoder

Operation unit

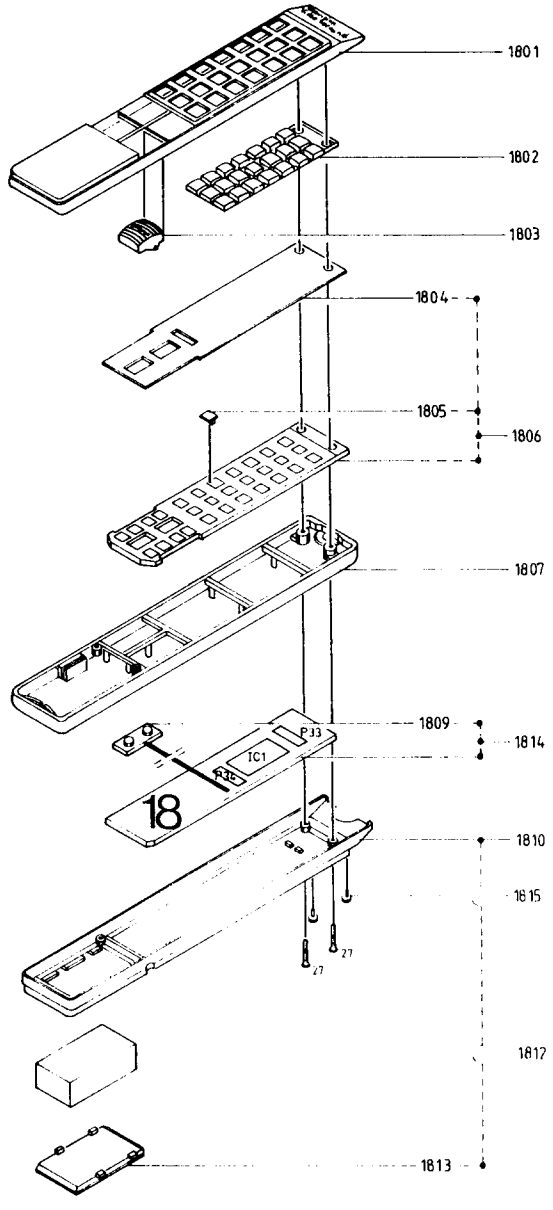


9101	3030081	Hinge
9102	3160008	Lid + window
9103	2550016	Holder
9104	2775987	Sliding button
9105	2775978	Sliding button
9106	3168413	Operating panel
9107	2775979	Tilting switch
9108	3375033	Lens
9109	7450043	Mains switch without cable
	6271102	Mains cable with Euro plug
	3034074	Holder f. mains cable
	2641119	Bushing f. mains cable
9110	3152419	Holder

05Modul	8003529	PCB05, IR Receiver

06Modul	8003542	PCB06, Operating Panel
0601	3322109	Window
0602	3131256	Housing for diodes

Video Terminal



18Modul	8053045	Video Terminal, compl.
1801	3164531	Cover, top
1802	2775962	Set of buttons
1803	2775963	Sensor buttons
1804	3974058	Insulating piece
1805	7500155	Contact spring
1806	8003358	Contact PCB for Video Terminal
	7500154	Contact pin
1807	2576125	Spacer
1809	7229020	Battery connection
1810	3164542	Cover, bottom
1812	8700008	Battery 9V
1813	3164375	Battery cover
1814	8003042	PCB18, Video Terminal
1815	3341020	Plastic foot

Parts not shown

6275571	Bundle of main cable
3152214	Cable binder
3152465	Cable holder
3629106	Trimming box spanner
	Packing:
3397557	Foam insert f. MX2000
3917213	Foam foil
3397569	Foam packing
3391910	Outer carton

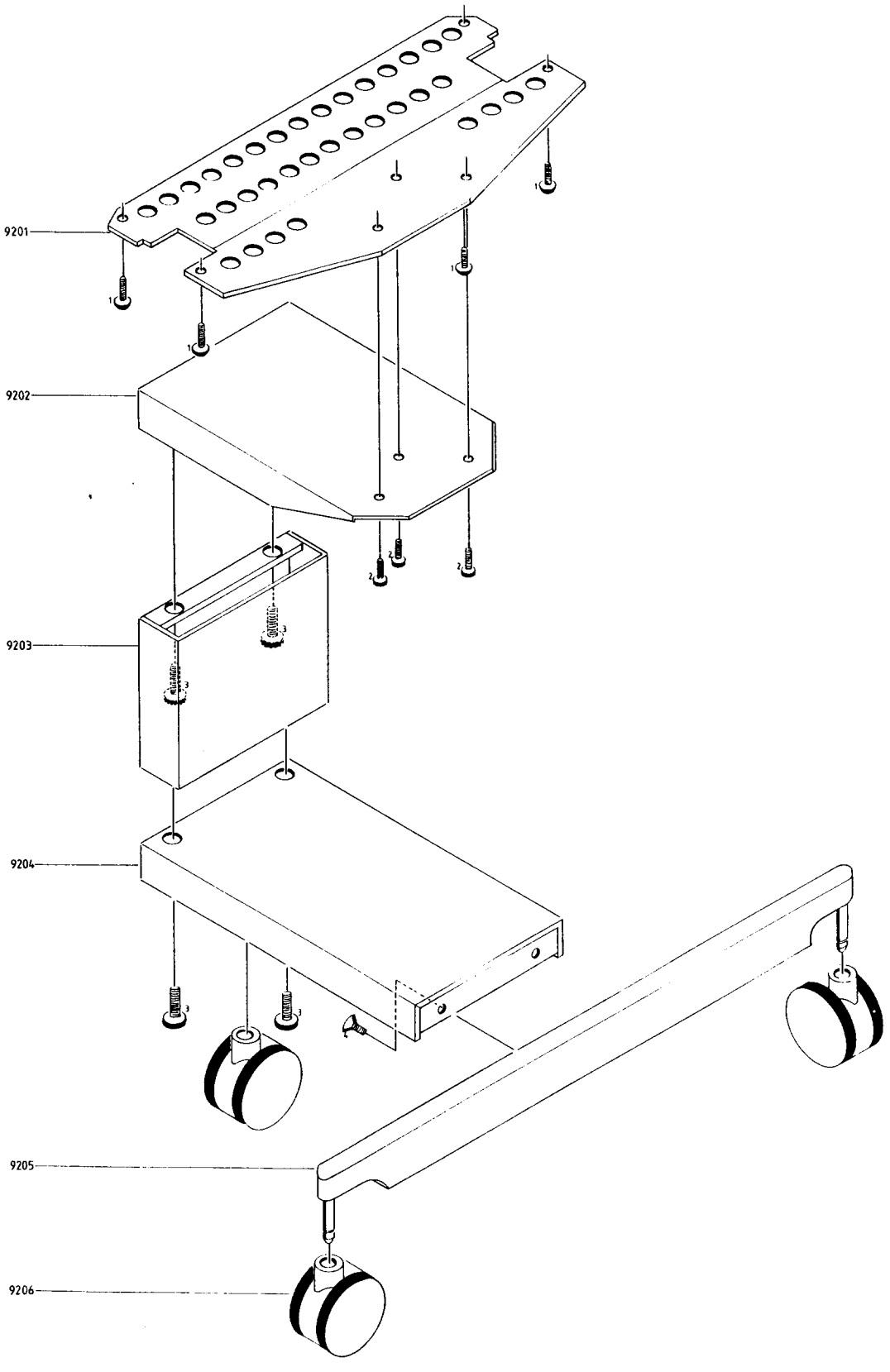
Survey of screws, washers and nuts for M20, MX2000 and Video Terminal

1	2013099	Screw 2.9 x 6.5mm
2	2013118	Screw 3.0 x 8mm
3	2019008	Screw 4.0 x 8mm
4	2015063	Screw 3.5 x 6.5mm
5	2019007	Screw 4.0 x 16mm
6	2015067	Screw 3.5 x 19mm
7	2013121	Screw 3.0 x 14mm
8	2043033	Screw AM 4 x 16
9	2622024	Washer ø 4.3mm
10	2622269	Tolerance washer
11	2623031	Washer
12	2044021	Screw AM 5 x 12
13	2039075	Screw M3 x 6
14	2019010	Screw 4.0 x 8mm
15	2019009	Screw 4.0 x 12mm
16	2043032	Screw AM 4 x 16mm
17	2021003	Screw 5.0 x 35mm
18	2021007	Screw 5.0 x 30mm
19	0376473	Washer
20	2015039	Screw 3.5 x 9.5mm
21	2013204	Screw 2.9 x 13mm
22	2013212	Screw 2.9 x 6.5mm
23	2380011	Nut M3
24	2038247	Screw M3 x 6
25	2622376	Washer
26	2015106	Screw 3.5 x 10mm
27	2034043	Screw 2 x 14mm
28	2622015	Washer

Survey of screws and nuts for TV Stand and Video Stands

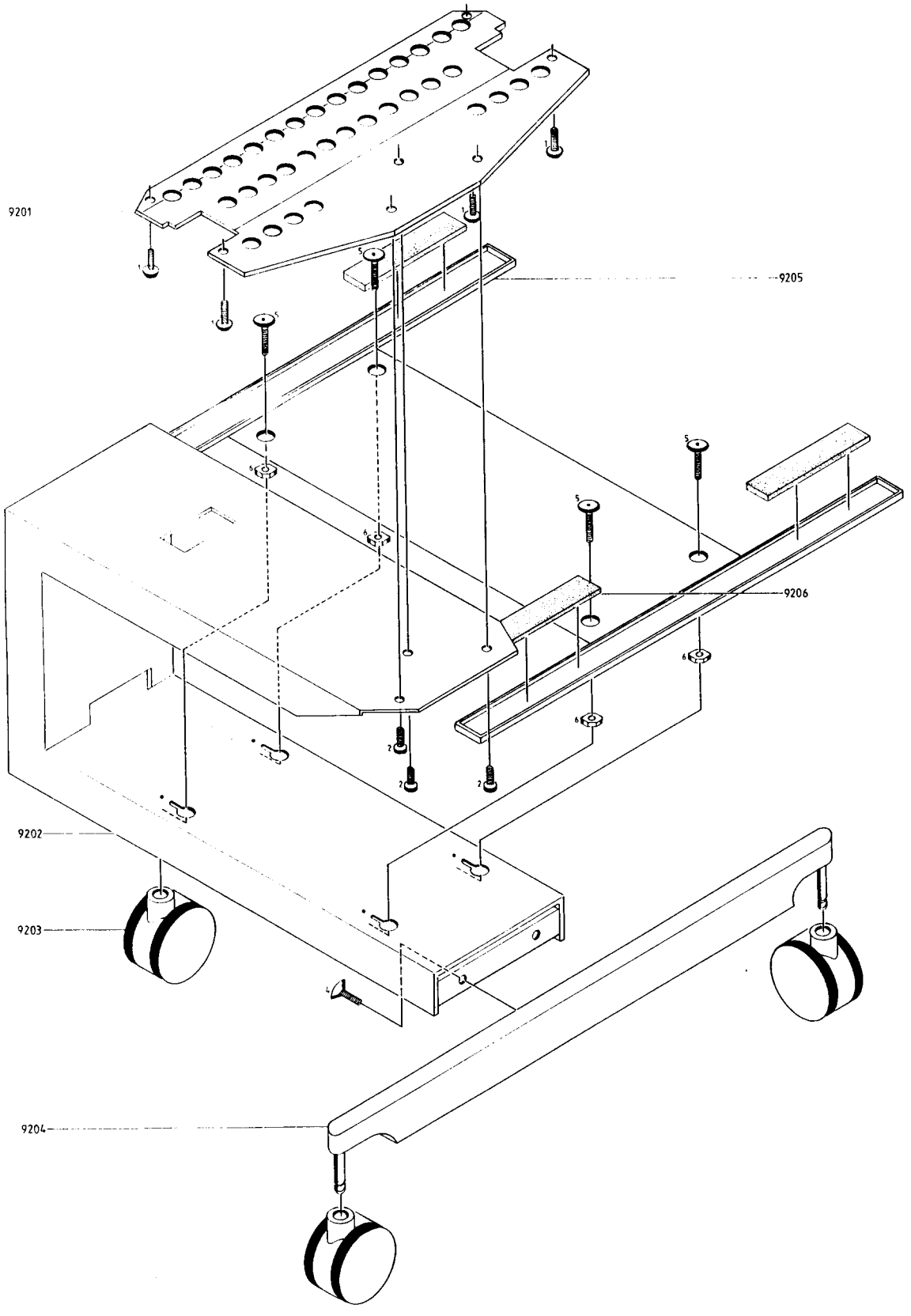
1	2044033	Screw 5 x 12mm
2	2042052	Screw 4 x 6mm
3	2048006	Screw 8 x 20mm
4	2044032	Screw 5 x 10mm
5	2044034	Screw 5 x 30mm
6	2380139	Nut M5
7	2044037	Screw 5 x 10mm

TV Stand 8930696



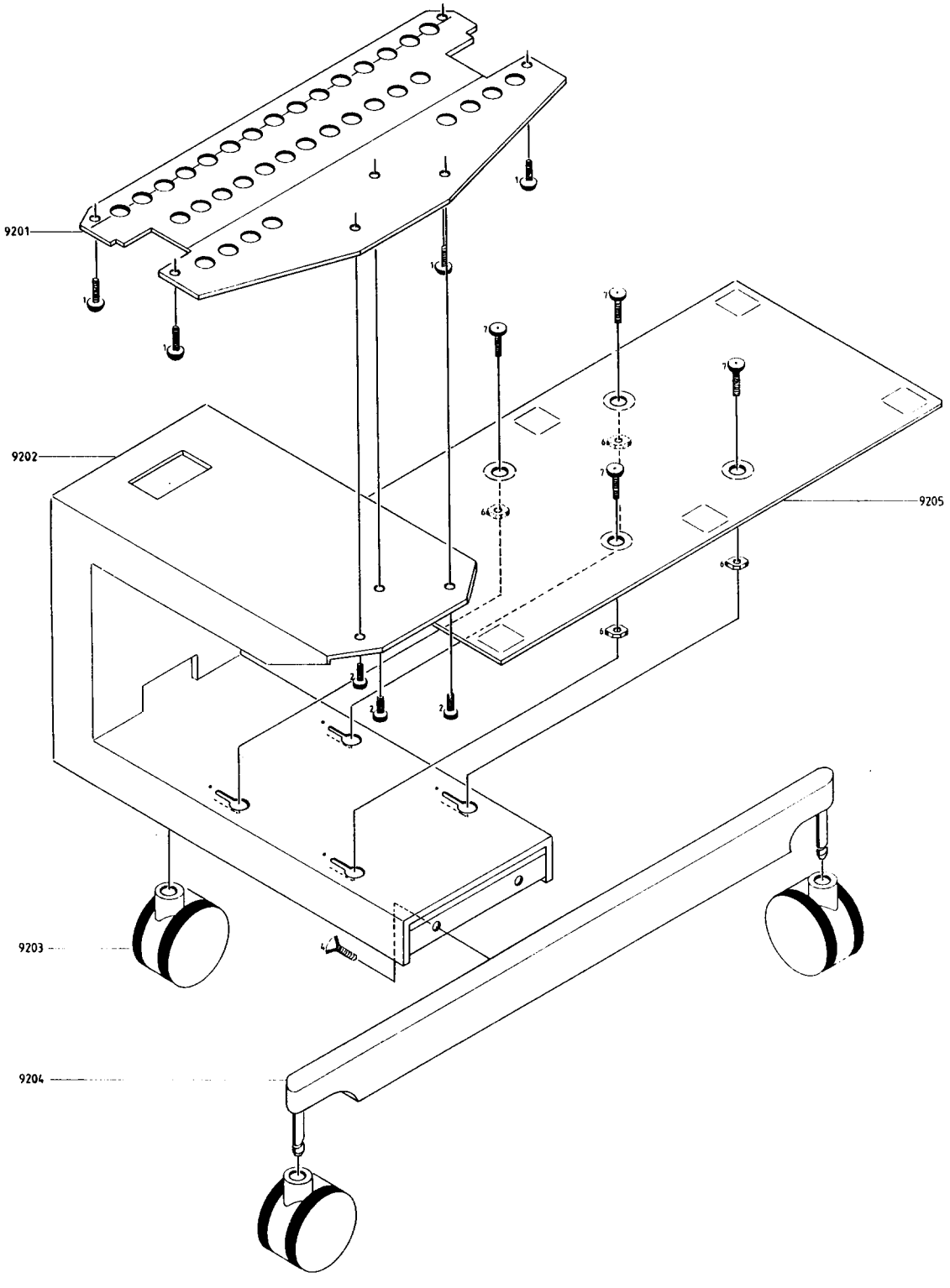
9201	3124098	Mounting plate	3040000	Hexagon spanner 3mm
9202	3100032	Frame top		
9203	3100034	Frame intermediate piece	3040019	Hexagon spanner 6mm
9204	3100035	Frame bottom	3391924	Packing, wrapping
9205	3450567	Profile	3397546	Foam packing
9206	3032002	Wheel		

Video Stand 8930706



9201	3124089	Mounting plate	9206	3912047	Felt self adhesive
9202	3100025	Frame		3040000	Hexagon spanner 3mm
9203	3032002	Wheel		3391925	Packing, wrapping
9204	3450544	Profile		3397547	Foam packing
9205	3151225	Video holder			

Video Stand 8930716



9201	3124089	Mounting plate	3040000	Hexagon spanner 3mm
9202	3100033	Frame		
9203	3032002	Wheel	3391925	Packing, wrapping
9204	3450562	Profile	3397547	Foam packing
9205	3151226	Video holder		

ACCESSORIES

Teletext kit S, 8003557

3181353	Label "TXT S" (3 pcs) PCB07 TXT Decoder S ch. only available as 8003557 Parts in common

Teletext kit D, 8003558

3181355	Label "TXT D" (3 pcs) PCB07 TXT Decoder D ch. only available as 8003558 Parts in common

Teletext kit GB, 8003559

3181357	Label "TXT GB" (3 pcs) PCB07 TXT Decoder GB ch. only available as 8003559 Parts in common

Parts in common for teletext kit

3543060	Mounting instruction
3503425	Owner's manual
3391574	Packing
3390292	Bag with parts:
2640045	Clamp
3152493	Module holder
2013106	Screw 2.9 x 16mm
2015106	Screw 3.5 x 10mm
6030420	Cable single 175mm
6275580	Flat cable 6 conductors 90mm
6275581	Flat cable 3 conductors 190mm
3390074	Bag 90x190

PAL/SECAM Decoder, 8003659

3181349	Label "PAL/SECAM" (3 pcs)
3543061	Mounting instructions
3391574	Packing
	PCB41 PAL/SECAM Decoder only available as 8003659

PAL/SECAM mounting kit 8003659 may be fitted into Beovision of the type 31xx system Pal B-G.
After building-in it is possible to receive system PAL/SECAM B-G.

SECAM B is transmitted e.g. from East Germany (Do not mistake SECAM B for the French system SECAM L or multistandard).

PAL B-G is transmitted e.g. from Scandinavia.

The switching between PAL and SECAM takes place automatically.

Indoor antenna 8720024

2625002	Washer
2013107	Screw 2.9x9.5 mm
3152006	Holder
3543063	Mounting instruction

JUSTERINGER

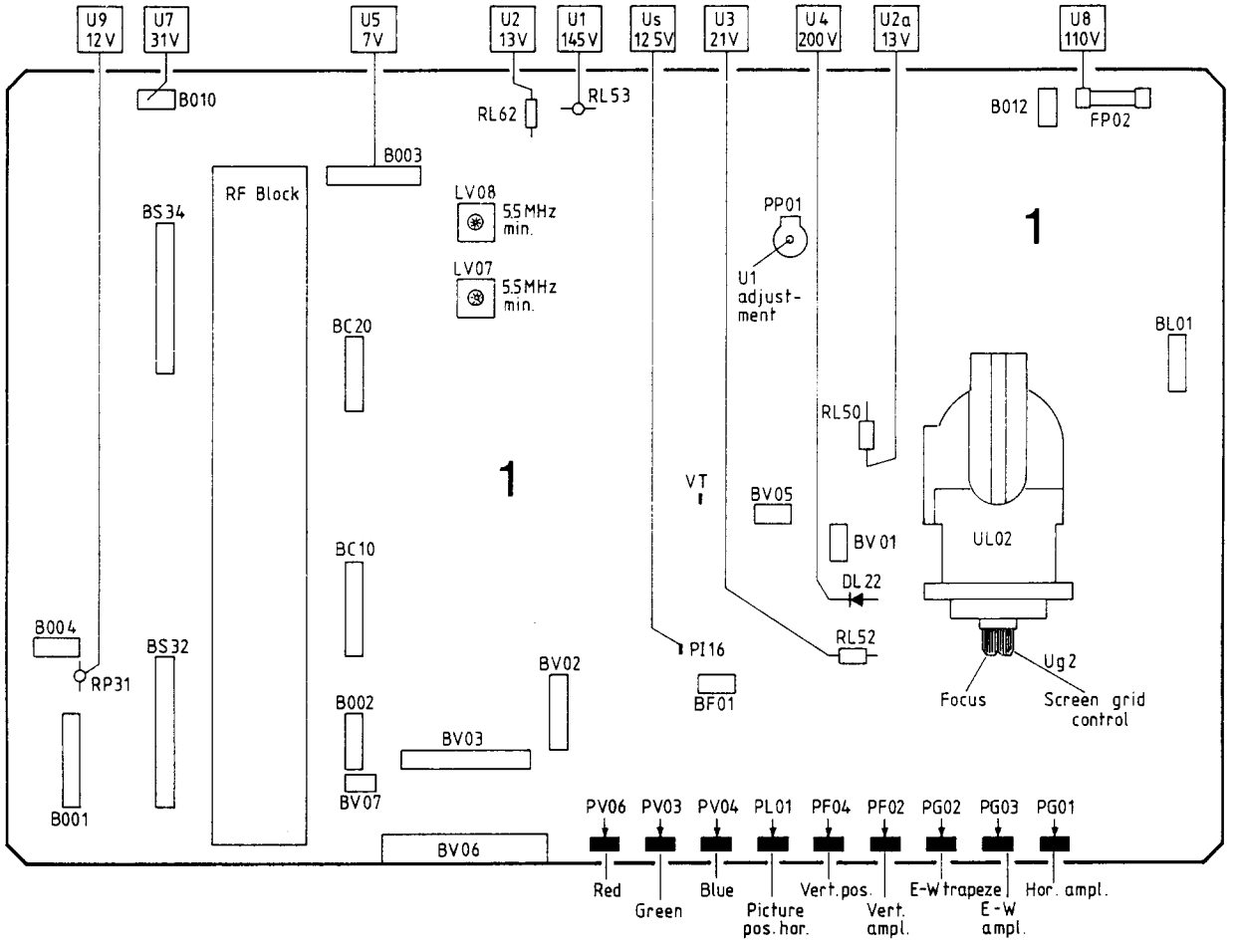
BASIC BOARD PCB 01

ADJUSTMENTS

BASIC BOARD PCB 01

EINSTELLUNGEN

BASIC BOARD PCB 01



Hovedspænding

1.1 Fjernsynet tilsluttes det af radiofonien udsendte testbillede.

1.2 Lys og kontrast indstilles til minimum.

1.3 DC voltmeter tilsluttes RL53 (U1).

1.4 Juster PP01 til 145 Volt ± 1 Volt.

Horisontal amplitude

2.1 Lys og kontrast indstilles normalt.

2.2 Juster PG01 til korrekt amplitude.

Vertikal amplitude

3.1 Juster PF02 til korrekt amplitude.

Principal voltage

Connect the TV set to the test pattern telecast by a TV station.

Set brilliance and contrast to minimum.

Connect a DC voltmeter to RL53 (U1).

Adjust PP01 to 145V ± 1V.

Horizontal amplitude

Set brilliance and contrast at normal values.

Adjust PG01 to the correct amplitude.

Vertical amplitude

Adjust PF02 to the correct amplitude.

Hauptspannung

Am Fernseher das vom Rundfunk ausgestrahlte Testbild einstellen.

Helligkeit und Kontrast auf das Minimum einstellen.

Gleichstrom-Voltmeter an RL53 (U1) anschließen.

PP01 auf 145 Volt ± 1 Volt einstellen.

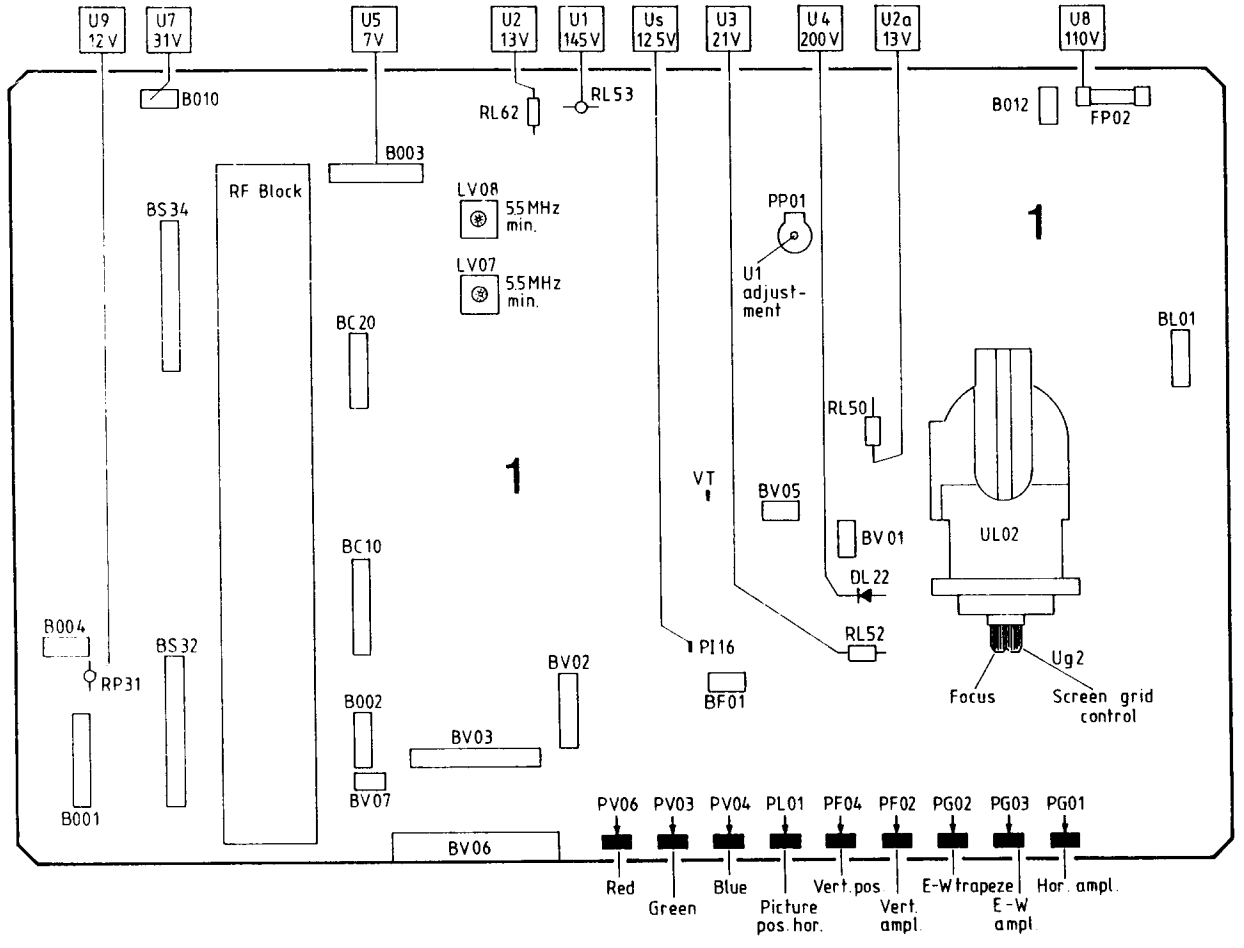
Horizontale Amplitude

Helligkeit und Kontrast normal einstellen.

PG01 auf korrekte Amplitude einstellen.

Vertikale Amplitude

PF02 auf korrekte Amplitude einstellen.



Horisontal position
4.1 Juster PL01 til korrekt position.

Horizontal position
Adjust PL01 to the correct position.

Horizontale Position
PL01 auf korrekte Position einstellen.

Vertikal position
5.1 Juster PF04 til korrekt position.

Vertical position
Adjust PF04 to the correct position.

Vertikale Position
PF04 auf korrekte Position einstellen.

Øst-vest trapez
6.1 Juster PG02 til korrekt geometri.

East-west trapezium
Adjust PG02 to the correct geometry.

Ost-West-Trapez
PG02 auf korrekte Geometrie einstellen.

Øst-vest amplitude
7.1 Juster PG03 til korrekt amplitude.

East-west amplitude
Adjust PG03 to the correct amplitude.

Ost-West-Amplitude
PG03 auf korrekte Amplitude einstellen.

Focus
8.1 Juster focus til bedste billede.

Focus
Adjust focus until the best picture is obtained.

Fokus
Fokus auf das beste Bild einstellen.

5,5MHz
9.1 Oscilloskop tilsluttes BV06 - 21-polet A/V-stik ben 19.

9.2 Juster LV07 og LV08 til minimum.

5.5MHz
Connect an oscilloscope to BV06 - 21-pole A/V socket pin 19.

Adjust LV07 and LV08 to minimum value.

5,5 MHz
Oszilloskop an BV06 anschließen - 21-polige A/V Stecker Stift 19.

LV07 und LV08 auf Minimum stellen.

Skærmgitterspænding

10.1 Hvis skærmgitterspænding justeres skal hvid justering og grå justering foretages.

10.2 Stil PV03, PV04 og PV06 i mekanisk midterposition.

10.3 Lys og kontrast indstilles til minimum.

10.4 Den af målepunkterne Z6, Z7 og Z9, på VIDEO OUTPUT PCB 02, der har den højeste DC spænding, justeres med Ug2, på diode split transformator, til maximum 165 Volt DC.

Screen grid voltage

In case the screen grid voltage is being adjusted, such adjust ments shall be followed by white and grey adjustments.

Set PV03, PV04, and PV06 in their respective mechanical mid positions.

Set brilliance and contrast to minimum.

Adjust that one of the test points Z6, Z7, and Z9, on VIDEO OUTPUT PCB 02, which has the highest DC voltage, by means of Ug2 on diode split transformer until a reading of max. 165V DC is obtained.

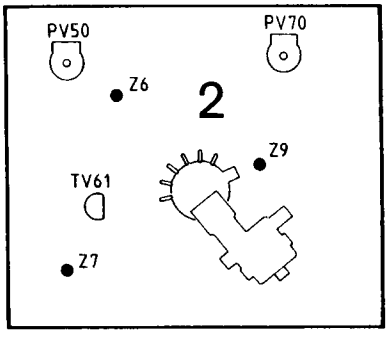
Schirmgitterspannung

Bei der Einstellung der Schirmgitterspannung ist sowohl eine weiße als auch eine graue Einstellung vorzunehmen.

PV03, PV04 und PV06 in mechanische Mittelposition bringen.

Helligkeit und Kontrast auf das Minimum einstellen.

Den von den Meßpunkten Z6, Z7 und Z9 mit der höchsten Wechselspannung versehenen Meßpunkt am VIDEO OUTPUT PCB 02 mit Ug2 am Diodentrenn-Trafo auf max. 165 Volt Gleichspannung einstellen.



Hvid justering

11.1 Farvebjælke signal.

11.2 Lys indstilles til minimum, kontrast indstilles til maximum.

11.3 Oscilloskop tilsluttes Z7 på VIDEO OUTPUT PCB 02.

11.4 Juster PV03 til 85 Volt spids spids (Vpp).

11.5 Juster PV04 og PV06 til hvide felter er farveløse.

White adjustment

Colour bar signal.

Set brilliance to minimum, and set contrast to maximum.

Connect an oscilloscope to Z7 on VIDEO OUTOUT PCB 02.

Adjust PV03 for 85V peak to peak (Vpp).

Adjust PV04 and PV06 until the white fields are colourless.

Wieße einstellung

Farbbalkensignal

Helligkeit auf Minimum, Kontrast auf Maximum stellen.

Oszilloskop an Z7 am VIDEO OUTPUT PCB 02 anschließen.

PV03 auf 85 Volt von Spitze zu Spitze stellen (Vpp).

PV04 und PV06 so verstellen, bis die weißen Felder farblos sind.

Grå justering

12.1 Farvebjælke signal.

12.2 Kontrast indstilles til minimum, lys indstilles til lige netop synligt.

12.3 På VIDEO OUTPUT PCB 02 justeres PV50 og PV70 til mørke felter er farveløse.

NB! Det kan være nødvendig at gentage hvid/grå -justeringen.

Grey adjustment

Colour bar signal.

Set contrast to minimum, and set brilliance until it is just visible.

Adjust PV50 and PV70 on VIDEO OUTOUT PCB 02 until the dark fields become colourless.

NOTE! It may prove necessary to repeat the white/grey adjustment.

Graue einstellung

Farbbalkensignal.

Kontrast auf Minimum stellen, Helligkeit gerade so einstellen, daß sie sichtbar wird.

Auf VIDEO OUTPUT PCB 02 PV50 und PV70 verstellen, bis die dunklen Felder farblos sind.

Anm.: Es kann u.U. erforderlich sein, die Weiß-/Grau-Einstellung zu wiederholen.

PAL DECODER PCB 40

PAL

13.1 PAL generator tilsluttes antenneindgangen. Signal farvebjælke.

Referencefrekvens 4,43MHz

14.1 Tilfør position 1 en DC spænding på 4,2 ..... 4,4 Volt.

14.2 Kortslut position 2 og 3.

14.3 Juster CC14 til min. farverul.

14.4 Kortslutning og DC spænding fjernes.

PAL Delay line

15.1 Lav lysstyrke, juster PC01 (PAL-ampl.) og LC05 (PAL phase) til minimum pallusi.

15.2 Justering 15.1 kan også foretages med oscilloskop. Oscilloskopets A-indgang forbindes til stik BC10 ben 2 (B-Y) og B-indgangen forbindes til stik BC10 ben 3 (R-Y). Oscilloskopet bringes i stilling X-Y. Juster PC01 og LC05 til vektorene har »sammenfald«.

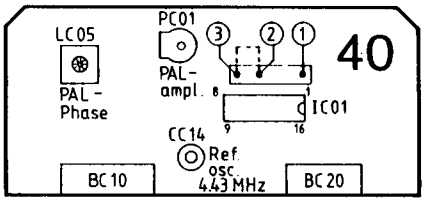
SOUND PCB 20/21

MF

16.1 Standard, 5,5/5,75MHz TV-stereo/dual-kanal, signal tilsluttes antenneindgangen.

Indstilling af generator:
a Dual kanal funktion.
b Fmod=1kHz (Kanal 1 og Kanal 2).
c Deviation: Kanal 1 (5,5MHz) ±25kHz
Kanal 2 (5,74MHz) ±25kHz + Pilot
d MF indgang niveau på ben 20 = 10 ..... 50mVAC

PAL DECODER PCB 40



PAL

Connect the PAL generator to the aerial input. Signal colour bar.

Reference frequency 4.43MHz

Apply to position 1 a voltage of 4.2V ..... 4.4V.

Bridge the positions 2 and 3.

Adjust CC14 to minimum colour crawl.

Remove the bridging and the DC voltage.

PAL Delay Line

While the brilliance is low, adjust PC01 (PAL ampl.) and LC05 (PAL phase) to minimum pallusi.

It is also possible to perform adjustment 15.1 by means of an oscilloscope. Connect the A-input of the scope to socket BC10, pin 2, (B-Y) and the B-input to socket BC10, pin 3, (R-Y). Set the oscilloscope in position X-Y. Adjust PC01 and LC05 until the vectors become "superimposed".

SOUND PCB 20/21

IF

Connect a standard, 5.5/5.75MHz TV stereo/dual channel signal to the aerial input.

Generator setting:
a Dual channel mode.
b Fmod = 1kHz (Channels 1 and 2).
c Deviation: Channel 1 (5.5MHz) ±25kHz,
Channel 2 (5.74MHz) ±25kHz + Pilot
d IF input level on pin 20 = 10 ..... 50mVAC

PAL DEKODER PCB 40

PAL

PAL-Generator an den Antenneneingang anschließen. Signal Farbbalken.

Bezugsfrequenz 4,43 MHz

An Position 1 eine Gleichspannung von 4,2 ..... 4,4 Volt anlegen.

Position 2 und 3 kurzschließen.

CC14 auf Minimum Farbbereich einstellen.

Kurzschließung und Gleichspannung entfernen.

PAL-Verzögerungsleitung

Geringe Lichtstärke, PC01 (PAL-Ampl.) und LC05 (PAL-Phase) auf minimalen PAL-Wert einstellen.

Einstellung 15.1 läßt sich auch mit dem Oszilloskop vornehmen. Dabei den A-Eingang des Oszilliskopes mit Stecker BC10, Stift 2 (B-Y) und den B-Eingang mit Stecker BC10, Stift 3 (R-Y) verbinden. Das Oszilloskop in Stellung X-Y bringen. PC01 und LC05 verstellen, bis die Vektoren übereinander liegen.

SOUND PCB 20/21

MF

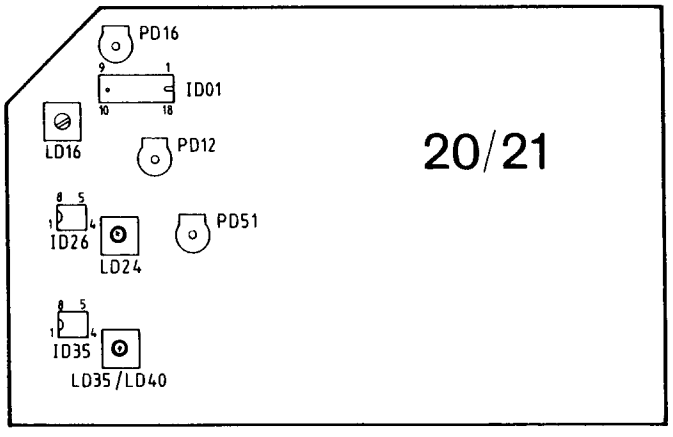
Standard, 5,5/5,75 MHz TV-Stereo/Dual-Kanal, Signal an Antenneneingang anschließen.

Einstellung des Generators:
a Dual-Kanal-Funktion.
b Fmod=1 kHz (Kanal 1 und Kanal 2).
c Ausschlag: Kanal 1 (5.5 MHz) ±25 kHz
Kanal 2 (5,74 MHz) ±25 kHz + Pilot
d MF-Eingang Niveau an Stift 20 = 10 ..... 50 mVAC

16.2 Tilslut AC-millivoltmeter (impedans >1Mohm) til ben 8 af ID35 på SOUND PCB 20/21.
Juster LD35/LD40 (5,5/6MHz discriminator) til max. (eller til min. THD).

Connect an AC millivoltmeter (impedance 1Mohm) to pin 8 of ID35 on the SOUND PCB 20/21.
Adjust LD35/LD40 (5.5/6MHz discriminator) to max. (or to min. THD).

Wechselstrom-Millivoltmeter (Impedanz >1 MOhm) an Stift 8 des ID35 am SOUND PCB 20/21 anschließen.
LD35/LD40 (5,5/6 MHz Diskriminator) auf max. (oder min. THD) einstellen.



16.3 Tilslut AC-millivoltmeter (impedans >1Mohm) til ben 8 af ID26 på SOUND PCB 20/21.
Juster LD24 (5,74MHz discriminator) til max. (eller til min. THD).
Ikke nødvendigt ved SOUND I PCB 21 (GB).

Connect an AC millivoltmeter (impedance 1Mohm) to pin 8 of ID26 on the SOUND PCB 20/21.
Adjust LD24 (5.74MHz discriminator) to max. (or to min THD).
Not necessary for the SOUND I PCB 21 (GB).

Wechselstrom-Millivoltmeter (Impedanz >1MOhm) an Stift 8 des ID26 am SOUND PCB 20/21 anschließen.
LD24 (5,74 MHz Diskriminator) auf max. (oder min. THD) einstellen.
Bei SOUND I PCB 21 (GB) nicht erforderlich.

Identifikation

17.1 Stereo generator indstilles til mono funktion.

17.2 Tilslut 5,5Volt DC gennem en 1kohms modstand til ben 11 af ID01 på SOUND PCB 20/21.

17.3 Tilslut DC voltmeter til ben 9 af ID01 på SOUND PCB 20/21.
Juster LD16 (54,7kHz spole) til max. DC volt (ca. 8 . . . . . 9 VoltDC).

17.4 Fjern 5,5 Volt DC forsyning (nævnt 17.2).

17.5 Generator indstilles til Dual kanal funktion.

17.6 Tilslut AC-millivoltmeter til ben 5 af ID01 på SOUND PCB 20/21.
Juster PD16 (274,1Hz) til max. (ca. 2 . . . . . 3 Volt AC rms).

Identification

Set the stereo generator in mono mode.

Apply 5.5V DC across a 1kohm resistor to pin 11 of ID01 on the SOUND PCB 20/21.

Connect a DC voltmeter to pin 9 of ID01 on the SOUND PCB 20/21.
Adjust LD16 (54.7kHz coil) to max. DC voltage (approx. 8 . . . . . 9V DC).

Remove the 5.5V DC supply (see 17.2).

Set the generator in Dual channel mode.

Connect an AC millivoltmeter to pin 5 of ID01 on the SOUND PCB 20/21.
Adjust PD16 (274.1Hz) to max. (approx. 2 ..... 3V AC RMS).

Kennzeichnung

Stereo-Generator auf Mono-Funktion einstellen.

5,5 Volt Gleichspannung über einen 1 kOhm-Widerstand an Stift 11 des ID01 am SOUND PCB 20/21 anlegen.

Gleichstrom-Voltmeter an Stift 9 des ID01 am SOUND PCB 20/21 anschließen.
LD16 (54,7 kHz-Spule) auf max. Gleichspannung (ca. 8 . . . . . 9 Volt Gleichspannung) einstellen.

5,5-Volt-Gleichspannungsversorgung (vgl. 17.2) entfernen.

Generator auf Dual-Kanal-Funktion einstellen.

Wechselstrom-Millivoltmeter an Stift 5 des ID01 am SOUND PCB 20/21 anschließen.
PD16 (274,1 Hz) auf max. (ca. 2 . . . . . 3 Volt Wechselspannung rms) einstellen.

17.7 Generator indstilles til stereo funktion.
Ikke nødvendigt ved SOUND I PCB 21 (GB).

Set the generator in stereo mode.
Not necessary for the SOUND I PCB 21 (GB).

Generator auf Stereo-Funktion stellen.
Bei SOUND I PCB 21 (GB) nicht erforderlich.

17.8 Tilslut AC-millivoltmeter til ben 15 af ID01 på SOUND PCB 20/21.
Juster PD12 (117,5Hz) til max. (ca. 2 . . . . . 3 Volt AC rms).
Ikke nødvendigt ved SOUND I PCB 21 (GB).

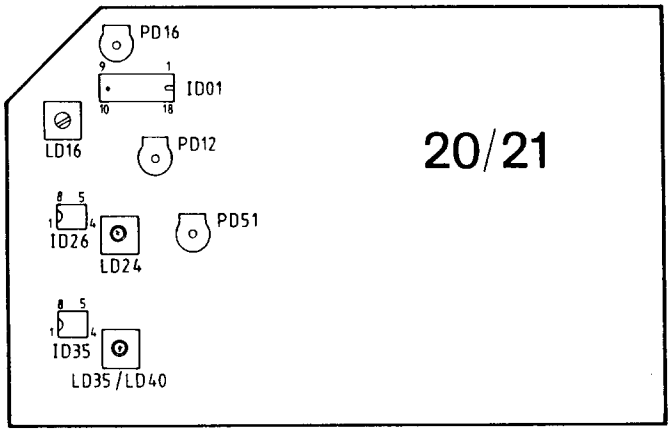
Connect an AC millivoltmeter to pin 15 of ID01 on the SOUND PCB 20/21.
Adjust PD12 (117.5Hz) to max. (approx. 2 . . . . . 3V AC RMS).
Not necessary for the SOUND I PCB 21 (GB).

Wechselstrom-Millivoltmeter an Stift 15 des ID01 am SOUND PCB 20/21 anschließen. PD12 (117,5 Hz) auf max. (ca. 2 . . . . . 3 Volt Wechselspannung rms) einstellen.
Bei SOUND I PCB 21 (GB) nicht erforderlich.

Tolerence ±2Hz for »ST« og »CH2«.

Tolerance ±2Hz for "ST" and "CH2".

Zulässige Abweichung ±2 Hz für »ST« und »CH2«.



Kanal separation

18.1 Generator indstilles til stereo funktion.
Ikke nødvendigt ved SOUND I PCB 21 (GB).

Channel separation

Set the generator in stereo mode.
Not necessary for the SOUND I PCB 21 (GB).

Kanaltrennung

Generator auf Stereo-Funktion einstellen.
Bei SOUND I PCB 21 (GB) nicht erforderlich.

18.2 Venstre kanals LF-modulation (1kHz), fra generator, fjernes.
Ikke nødvendigt ved SOUND I PCB 21 (GB).

Remove the AF modulation (1kHz) from the generator.
Not necessary for the SOUND I PCB 21 (GB).

LF-Modulation des linken Kanals (1 kHz), vom Generator aus gesehen, entfernen.
Bei SOUND I PCB 21 (GB) nicht erforderlich.

18.3 Tilslut AF-millivoltmeter til BV06 - 21-polet A/V-stik ben 3.
Juster PD51 (kanal separation) på SOUND PCB 20/21 til min. (min. separation for Fmod = 1kHz skal være >35dB).
Ikke nødvendigt ved SOUND I PCB 21 (GB).

Connect an AC millivoltmeter to BV06 - 21-pole A/V socket pin 3.
Adjust PD51 (channel separation) on the SOUND PCB 20/21 to minimum. (minimum separation for Fmod = 1kHz shall be >35dB).
Not necessary for the SOUND I PCB 21 (GB).

Wechselstrom-Millivoltmeter an BV06 - 21-polige A/V Stecker Stift 3 anschließen.
PD51 (Kanaltrennung) am SOUND PCB 20/21 auf min. einstellen (min. Trennung für Fmod = 1 kHz muß >35 dB sein).
Bei SOUND I PCB 21 (GB) nicht erforderlich.

TEKST-TV PCB 07

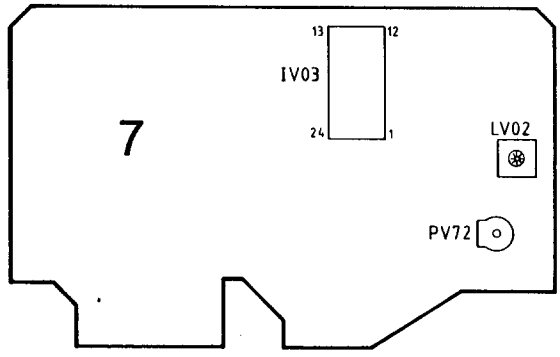
Volt

19.1 Med potentiometer PV72 justeres til 4,95 Volt DC på ben 12 af IV03 på Teletext Decoder PCB 07.

Fejludskrift

20.1 I tilfælde af fejludskrift ved valg af ny tekstside, kan LV02 justeres.
Hvis muligt vælges en tekstside som tilføres informationer hele tiden f. eks. uret.
Antennesignalet dæmpes indtil fejl forekommer, LV02 justeres til minimum fejl.

TELETEXT PCB 07



Volt

Adjust with the potentiometer PV72 until a reading of 4.95V DC is obtained on pin 12 of IV03 on the Teletext Decoder PCB 07.

Wrong readout

LV02 is adjustable, e.g. when a wrong readout page appears after selection of new text page.
If possible, select a page that is continuously being fed with new information, e.g. the clock.
Mute the aerial signal until faults are present, and adjust LV02 to minimum fault.

TELETEXT PCB 07

Volt

Mit dem Potentiometer PV72 auf 4,95 Volt Gleichspannung an Stift 12 des IV03 am Teletext-Dekoder PCB 07 einstellen.

Fehlausgabe

Im Falle einer Fehlausgabe bei der Wahl einer neuen Textseite läßt sich LV02 justieren.
Möglichst Textseite wählen, der ständig Informationen zugeführt werden, z.B. die Uhr.
Das Antennensignal dämpfen, bis ein Fehler auftritt, LV02 auf min. Fehler einstellen.

PAL/SECAM PCB 41

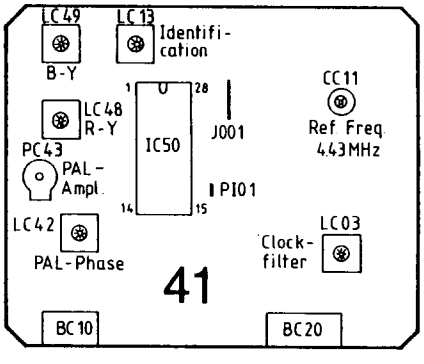
SECAM

21.1 SECAM generator tilsluttes antenneindgangen. SECAM farvebjælke.

Identifikation

22.1 Med LC13 justeres til flimmerfri farvebillede.

PAL/SECAM PCB 41



SECAM

Connect the SECAM generator to the aerial input. SECAM colour bar.

Identification

Adjust with LC13 until a flicker-free TV picture is obtained.

PAL/SECAM PCB 41

SECAM

SECAM-Generator an den Antenneneingang anschließen.
SECAM-Farbbalken.

Kennzeichnung

Mit LC13 auf flimmerfreies Farbbild einstellen.

(B-Y) Demodulator

23.1 Tilslut oscilloskopet til ben 3 af IC50 (B-Y udgangen).

23.2 Med LC49, justeres hvidt niveau til samme værdi som linie tilbageløbspulserne.

(R-Y) Demodulator

24.1 Tilslut oscilloskopet til ben 1 af IC50 (R-Y udgangen).

24.2 Med LC48, justeres hvidt niveau til samme værdi som linie tilbageløbspulserne.

(B-Y) Demodulator

Connect an oscilloscope to pin 3 of IC50 (the B-Y output).

Adjust with LC49 until the white level has the same value as the line flyback pulses.

(R-Y) Demodulator

Connect an oscilloscope to pin 1 of IC50 (the R-Y output).

Adjust with LC48 until the white level has the same value as the line flyback pulses.

(B-Y) Demodulator

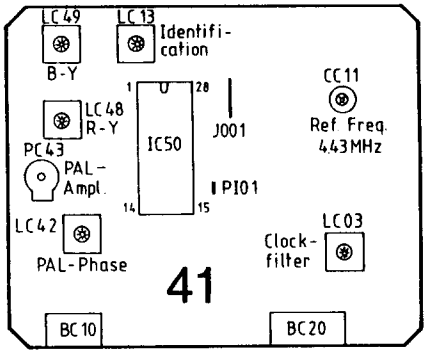
Das Oszilliskop an Stift 3 des IC50 (B-Y-Ausgang) anschließen.

Mit LC49 weißes Niveau auf den gleichen Wert wie die Zeilenrükklaufimpulse einstellen.

(R-Y) Demodulator

Das Oszilloskop an Stift 1 des IC50 (R-Y-Ausgang) anschließen.

Mit LC48 weißes Niveau auf den gleichen Wert wie die Zeilenrükklaufimpulse einstellen.



Clockfilter

25.1 Tilslut oscilloskopet til ben 15 af IC50.

25.2 Et SECAM video signal tilføres BV06 - 21-polet A/V-stik.

25.3 Juster LC03 til samme farvebjælkeamplitude.

NB! Hvis fjernsynet tilsluttes et SECAM signal, via antennen, dæmpes signalet mest muligt og LC03 justeres til bedst muligt SECAM billede.

Clock filter

Connect an oscilloscope to pin 15 of IC50.

Apply a SECAM video signal to BV06 - 21-pole A/V socket.

Adjust LC03 to the same colour bar amplitude.

NOTE! If the TV set is connected to a SECAM signal, via the aerial, the signal shall be muted as much as possible and LC03 shall be adjusted to the optimum SECAM picture.

Clockfilter

Das Oszilliskop an Stift 15 des IC50 anschließen.

Ein SECAM-Video-Signal wird dem 21-polige BV06 - A/V Stecker zugeführt.

LC03 auf gleiche Farbbalken-Amplitude justieren.

Anm.: Falls der Fernseher über die Antenne an ein SECAM-Signal angeschlossen wird, Signal soweit wie möglich dämpfen und LC03 auf das bestmögliche SECAM-Bild einstellen.

PAL

26.1 PAL generator tilsluttes antenneindgangen. Signal farvebjælke.

PAL

Connect the PAL generator to the aerial input. Signal colour bar.

PAL

PAL-Generator an den Antenneneingang anschließen. Signal Farbbalken.

Referencefrekvens 4,43MHz

27.1 Kortslut PI01 til stel.

27.2 Juster CC11 til min. farverul.

27.3 Kortslutning fjernes.

Reference frequency 4.43MHz

Short PI01 to chassis.

Adjust CC11 to minimum colour crawl.

Remove the short.

Bezugsfrequenz 4,43 MHz

PI01 am Gestell kurzschließen.

CC11 auf Minimum Farbbereich justieren.

Kurzschluß entfernen.

PAL Delay line

28.1 Lav lysstyrke, juster PC43 (PAL-ampl.) og LC42 (PAL phase) til minimum pallusi.

28.2 Justering 28.1 kan også foretages med oscilloskop. Oscilloskopets A-indgang forbindes til stik BC10 ben 2 (B-Y) og B-indgangen forbindes til stik BC10 ben 3 (R-Y).
Oscilloskopet bringes i stilling X-Y. Juster PC43 og LC42 til vektorene har »sammenfald«.

PAL Delay Line

With the brilliance set low, adjust PC43 (PAL ampl.) and LC42 (PAL phase) to minimum pallusi.

It is also possible to perform adjustment 28.1 by means of an oscilloscope. Connect the A-input of the scope to socket BC10, pin 2 (B-Y), and the B-input to socket BC10, pin 3 (R-Y). Set the oscilloscope in position X-Y. Adjust PC43 and LC42 until the vectors become "superimposed".

PAL Verzögerungsleitung

Geringe Lichtstärke, PC43 (PAL-Ampl.) und LC42 (PAL-Phase) auf min. PAL-Wert einstellen.

Die Einstellung 28.1 kann auch mit dem Oszilloskop vorgenommen werden.
Dabei den A-Eingang des Oszilloskopes mit Stecker BC10, Stift 2 (B-Y) und den B-Eingang mit Stecker BC10, Stift 3 (R-Y) verbinden.
Das Oszilloskop in Stellung X-Y bringen. PC43 und LC42 verstellen, bis die Vektoren übereinander liegen.

Bang&Olufsen

TECHNICAL SPECIFICATIONS	BEOVISION M20 – MX2000
Type No.	3101-3102-3103-3116-3117-3118
CTV system	B/G PAL S-tuner
Picture tube size	20" – 51 cm
Cabinet	M20 – grey
	MX2000 red – grey metallic – white – black
	Stereo sound
	Stereo decoder, billingual sound
	Stereo enhancement
	Mono ambio sound
	Contrast screen – MX2000 only
TV programmes	1-32
VCR programmes	9, 31, 32
AV programmes	0, 33, 34
Satellite programme	0
Digital tuning system	100 channels (0-99)
Tuner range	VHF 2-12, S1-S19
	UHF 21-69
Picture tube	110°in line, black matrix, self converging
Start time	Approx. 5 sec.
Speakers, stereo	Log line system, 2 pcs. 3"-8 cm
Sound power output	2 x 7 watts/8 ohms
Harmonic distortion	<0.5%/2 watts, <3%/7 watts
Intermodulation	<1%
Frequency range ±1.5 dB	30-20,000 Hz (25-25,000 Hz ±6 dB
Power bandwidth	60-15,000 Hz
Signal-to-noise ratio	>50 dB
Bass control	±10 dB/60 Hz
Treble control	±10 dB/10,000 Hz
Power supply	220-240 volts/50-60 Hz
Power consumption	70 (50-120) watts
Stand by	<5 watts
Dimensions W x H x D/weight	49 x 53 x 40 cm/23 kg
Connections:	
A/V, audio/video IN/OUT	21 pin
Headphones output	Max. 5V/200 ohms
External speakers	4-8 ohms
Tape output	300 mV/47 kohms
Amplifier output	300 mV/47 kohms
Terminal controlled output	0-300 mV/55 kohms
Accessories:	
Stereo headphones	Form1 – 8964020
Loop amplifier	8003316
Indoor antenna	8720024
TV Stand	Type 3069
Video Stand – Beocord VHS	Type 3070
Video Stand – Video 2000/VHS62	Type 3071
Installation kit for:	
Teletext S	8003557
Teletext D	8003558
Teletext GB	8003559
PAL/SECAM decoder	8003659

Subject to change without notice

TECHNICAL SPECIFICATIONS	BEOVISION M20 – MX2000
Type No.	3104-3105-3119-3120
CTV system	I PAL S-tuner
Picture tube size	20" – 51 cm
Cabinet	M20 – grey
	MX2000 – red – grey metallic – white – black
	Infrared cordless remote control
	Stereo sound
	Stereo enhancement
	Mono ambio sound
	Contrast screen – MX2000 only
TV programmes	1-32
VCR programmes	9, 31, 32
AV programmes	0, 33, 34
Satellite programme	0
Digital tuning system	100 channels (0-99)
Tuner range	VHF 2-12, S1-S19
	UHF 21-69
Picture tube	110°in line, black matrix, self converging
Start time	Approx. 5 sec.
Speakers, stereo	Log line system, 2 pcs. 3"-8 cm
Sound power output	2 x 7 watts/8 ohms
Harmonic distortion	<0.5%/2 watts, <3%/7 watts
Intermodulation	<1%
Frequency range ±1.5 dB	30-20,000 Hz (25-25,000 Hz ±6 dB)
Power bandwidth	60-15,000 Hz
Signal-to-noise ratio	>50 dB
Bass control	±10 dB/60 Hz
Treble control	±10 dB/10,000 Hz
Power supply	240-265 volts/50-60 Hz
Power consumption	70 (50-120) watts
Stand by	<5 watts
Dimensions W x H x D/weight	49 x 53 x 40 cm/23 kg
Connections:	
A/V, audio/video IN/OUT	21 pin
Headphones output	Max. 5V/200 ohms
External speakers	4-8 ohms
Tape output	300 mV/47 kohms
Amplifier output	300 mV/47 kohms
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Video Stand – Beocord VHS	Type 3070
Video Stand – Video 2000/VHS 62	Type 3071
Installation kit for:	
Teletext GB	8003559
Teletext D	8003558
Teletext S	8003557
PAL/SECAM decoder	8003659

Subject to change without notice

CIRCUIT DESCRIPTION

INTRODUCTION

This description explains circuits and functions which in some way or other are special, while no mention is made of circuits which are considered familiar.
Certain circuits are not being dealt with since, probably, they will not be repaired, but replaced as a unit if faulty. This applies to the RF block and the IR receiver.
When in the text reference is made to components which are not shown by illustrations, the circuit diagram should be used.

CONTENTS

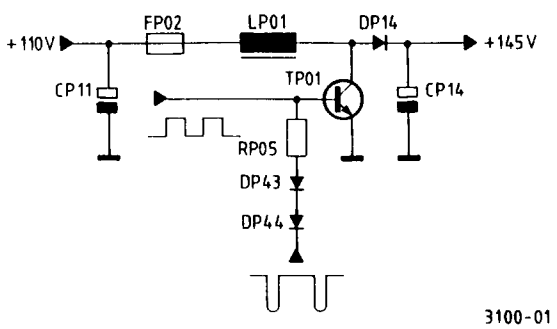
7-1 SMPS power supply
7-2 Deflection circuit
7-5 East/West correction
7-6 Automatic cut-off
7-8 Sound module
7-9 System control

SMPS Power Supply

Functional principle (see diagram)

A "Step-up" power supply unit is used. The U8 of 110V is stepped up to 145V and stabilized.

The switch transistor TP01 is triggered ON for part of the line scan time by means of a pulse from IL01, pin 7. This causes a current to flow from U8 (110V) through FP02, LP01, TP01, and RP03 to chassis. In LP01 magnetic energy is charged.
From the line transformer (UL02, pin 11) a horizontal flyback pulse is passed via DP44, DP43, and RP05 to the base of TP01 and blocks the latter.
The magnetic energy in LP01 will now create a current which via DP14 will charge the capacitor CP14.



Control circuit

From the voltage divider RL46, PP01, and RL47 part of the supply voltage U1 is returned to IL01, pin 9.

Internally in IL01 the voltage is compared with a reference voltage of 1.26V, and it controls a phase modulator which varies the point in time when TP01 wil start conducting.

If, by way of example, U1 should drop due to a higher load or fluctuations in the mains voltage, this will cause TP01 to conduct earlier. Thus, the coil LP01 will get time to collect more energy which it passes on to CP14 when TP01 is blocking again. U1 will then rise to its correct value.

Stand by

When the mains switch is closed the power supply unit will supply U8 (110V) and the start-up voltage will supply Us (12.5V).

As long as the TV set is in stand-by mode, U8 is a preliminary supply voltage for horizontal output stage through the components FP02, LP01, DP14, RP14, and UL02, pin 8.

The horizontal driver is supplied with Us (12.5V) via the diode DP13.

Start up

When the TV set is brought ON the system control (PCB08) will supply a low level to the base of TP21. TP21 will be conducting and the 12.5V voltage will be conducted via the diodes DP21, DP24, DP03, TP21, and RP27 to IL01 as its supply voltage (reduced to *approx. 10V* by the voltage drop of the diodes).

The horizontal oscillator will start to oscillate, the line deflection circuit will be driven and will in the line transformer generate the required operative voltages (U2-U3-U4-U5).

The supply for the driver stage (TL01) and for the switch-transistor TP21 will now be taken over by U3 (21V) and U2a (13V) via the diodes DP23 and DP15.

Soft start

When starting up the vertical and horizontal deflection circuits in TEA 2026 will begin to function at a voltage of approx. 6V on pin 8.

The SMPS power supply unit is slowly started up by an internal "Soft-start" circuit.

Protective circuit

If the voltage on IL01, pin 28, should exceed 1.26V, both vertical, horizontal and the SMPS power supply unit will be turned off. If the voltage then again falls below 1.26V the SMPS power supply unit will be restarted via the Soft-start circuit. If this is repeated for a total of three times, the power supply unit will be turned off completely and will be restartable only when the supply voltage for IL01 has been removed.

If U1 (145V) increases, then U3 (21V) will be increased as well. The Zener diode DF25 will be conducting and will via DF25 increase the voltage on IL01, pin 28. This will activate the protective circuit.

In case of excessive power consumption the voltage across RP03 will increase to such an extent that the protective circuit will be activated via RP04 and RF30.

Horizontal Deflection

Horizontal generator

The horizontal generator is located in IL01. It delivers a control pulse for the horizontal driver and the output on pin 10. The line frequency is generated by dividing the 500kHz VCO (500kHz - 32 = 15,625Hz).

After dividing the 500 kHz the line frequency is passed to phase detector 1 where it is compared with the horizontal sync. pulses from the sync. separator.

The resultant voltage will control the VCO and will thus maintain the phase ratio between horizontal sync. pulses and keep the divided frequency of the VCO constant.

Normally the controlling time constant is long which results in a high noise immunity. But in AV mode this time constant is made short by activation of IL01, pin 23. This will reduce picture swaying resulting from unstable sync. timing from, e.g. a video tape recorder.

The 2nd phase detector keeps constant the phase ratio between horizontal oscillator and horizontal flyback pulses. It is possible to influence the phase ratio by means of the DC voltage on IL01, pin 16. The potentiometer PG01 will thus adjust the horizontal centering.

In the horizontal output (IL01) a constant pulse time of 26µs is applied to the pulse before it is passed to pin 10 with an amplitude of 6.5Vpp.

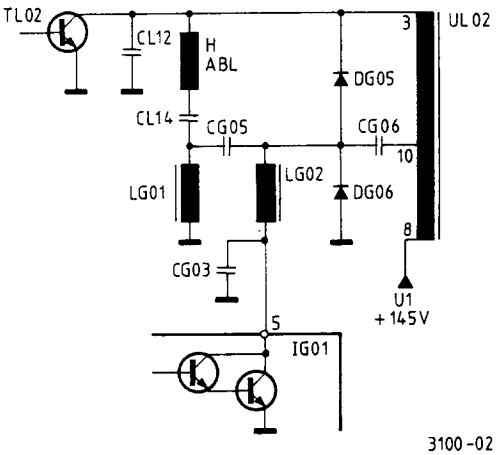
Fault situations

In case of faults (Voltage, pin 28 bigger than 1.26V) the horizontal output will be cut out by the protective circuit.

Horizontal output stage

The driver transistor TL01 will amplify the line pulses and will drive TL02 with sufficient base current via the transformer UL01. RL21, CL21 will suppress voltage spikes arising at the end of the line pulse.

The transistor TL02 operates as a switch and is closed in the latter half part of the horizontal scanning time.
In the former half part of the horizontal scanning time the diodes DG05 and DG06 will conduct.
Neither TL02, DG05 nor DG06 will be conducting during the flyback time. Current will now flow in the flyback capacitor CL12. Fig. 02 shows the deflection circuit in a simplified form.

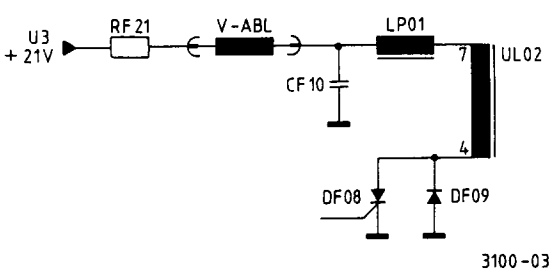


The deflection coil is dampened by means of the components DL18, RL18, CL18, CL19.

Vertical Deflection
Functional principle

The vertical output stage is driven from IL02 by pulse width modulated horizontal frequency pulses. The objective is to obtain a low power consumption.

Since these pulses are purely positive, the vertical deflection coil is included in a bridge coupling between U3 (21V) and the vertical generator. This will result in positive as well as negative going current in the deflection coil.



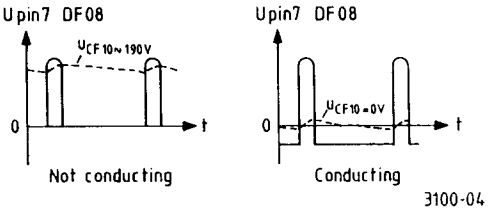
The following two fictive situations will illustrate the functions of the circuit.

1. Thyristor DF08 is constantly open

The positively going horizontal flyback pulses are grounded through DF09. This rectifier effect causes positive going flyback pulses on UL02, pin 7, and these will charge the capacitor CF10 to approx. 190V. A current will flow from CF10 via the deflection coil to the power supply unit U3 (21V).

2. The thyristor is constantly conducting

Pin 4 of UL2 is constantly connected to chassis. Therefore the flyback pulses on pin 7 will be symmetrical around 0. The voltage present on CF10 will be 0V, and the deflection current will now flow from U3 (21V) through the deflection coil.



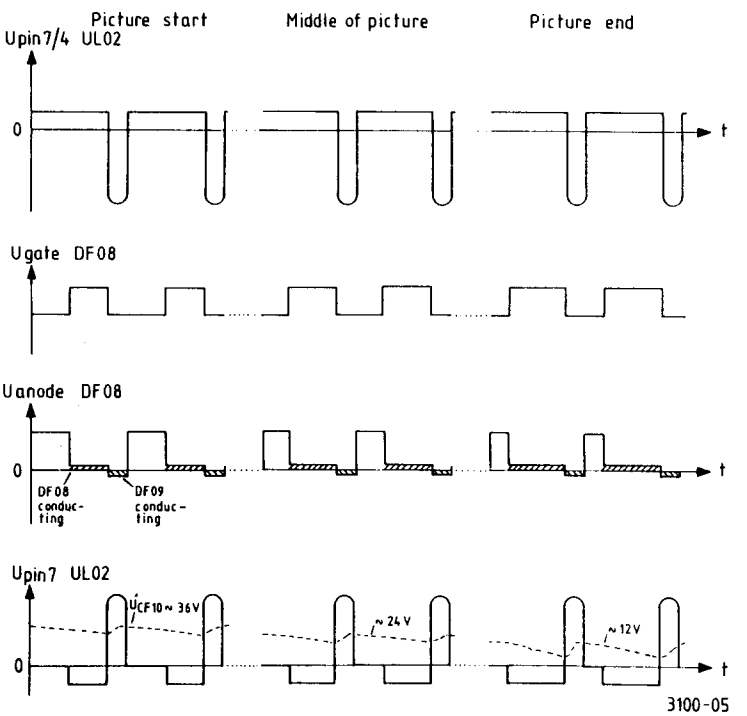
Scanning

The thyristor will be driven ON from IL04, pin 4, by means of a pulse-width modulated voltage. The control voltage will always end at the leading edge of the flyback pulse. The thyristor will be turned OFF by the negatively going flyback pulses from UL02, pin 4.

When a vertical scanning is initiated the control pulses are relatively narrow, and will result in a voltage of approx. 36V on CF10. Nearer the end of a scanning operation the control pulses become wider and wider. The thyristor will be conducting for longer and longer periods of time, and on termination of the scanning a voltage of approx. 12V will be present on CF10.

During the picture fly-back the thyristor will remain open. This means that max. voltage (approx. 190V) is stored in CF10, which results in a rapid fly-back.

Fig. 05 shows the individual pulses at the start, the centre and the end of a half-picture.



Control

The complete control circuit is located in the IC IL01 (see diagram).

On pin 5 of IL01 a sawtooth pulse of 3.5Vpp is built up. CL64 is a charging capacitor and via RL64 and RL65 the voltage U4 (200V) is the power source. The 50Hz (60Hz) frequency is formed by dividing the 500kHz by the quartz oscillator and synchronising it with vertical sync. pulses from a TV signal, if present.

The sawtooth pulse controls a phase modulator which is operating with horizontal frequency. The higher the instant value of the sawtooth, the wider the line frequency square pulse on the output of the modulator.

By means of the potentiometer PF04 the DC operative point for the phase modulator is set and thus the vertical centering.

The pulse-width modulated voltage passes the vertical out and controls, via pin 4 of IL01, the thyristor UF08.

Fault situations

In case of faults (IL01, pin 28 bigger than 1.26V) the vertical output pulses will stop.

Feedback

RF21 is in series with the vertical deflection coil with the result that it will have a voltage across which is proportional to the deflection current. This voltage is taken to the phase modulator in IL01 as a feedback voltage.

By means of PF02 the amplitude of the feedback voltage is altered and thus the picture height.

S correction

The components DF03, DF05, and RF19 are used for S correction.

In the centre of the picture the voltage across RF21 is so low that the two diodes are not conducting.

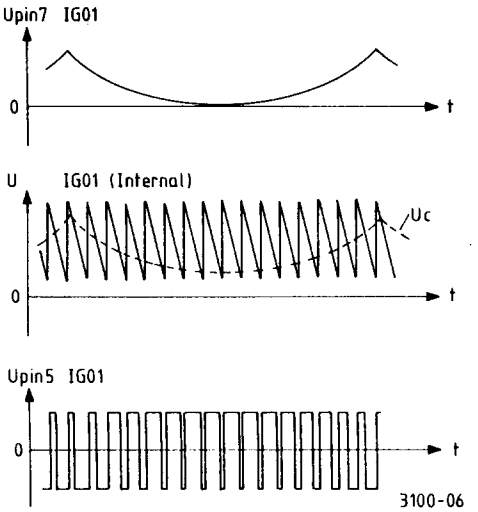
At the top and bottom quarters of the picture the diodes are conducting whereby the feedback voltage is increased, via RF19. Thereby the increase of the deflection current is being reduced in the top and bottom sections of the picture.

East/West Correction

The complete East/West correction circuit is integrated in IG01, TDA4950 (see diagram).

A vertical sawtooth voltage is present on the inverted input of the operative amplifier (IG01, pin 2). By means of the adjustable voltage on the negative input (IG01, pin 1) adjustment is made in such a manner that the sawtooth on the output of the operational amplifier is placed symmetrically around the zero line. By varying this DC voltage the keystone (trapezoidal) adjustment of the picture is made.
The two subsequent blocks will convert the sawtooth voltage to a parabolic voltage (Fig. 06) dependent of the picture frequency.

The parabolic voltage is passed to a comparator. On the negative input a linefrequency sawtooth voltage is present which has been generated by charging CG01 with positive horizontal flyback pulses from UL02, pin 9, across DG01, PG01, RG01, and RL51. Discharging takes place during the horizontal scanning time via a current source in IG01, pin 8. Then the comparator will supply linefrequency pulse modulated square voltages



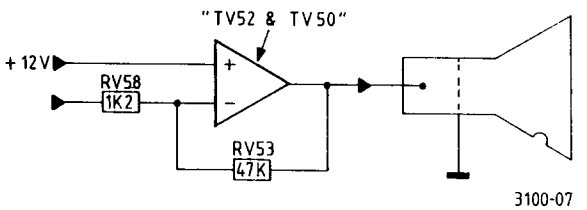
Via LG02 the subsequent Darlington coupled output stage draws a parabolic shaped current in the diode modulator DG05, DG06 and the associated components.

By means of PG01 the charging of CG01 is varied and thus the DC share of the line-frequency sawtooth. This will vary the width of all square pulses from the comparator, and thus the current in the diode modulator corresponding to an alteration of the current in the horizontal deflection coil. This will cause an alteration of the picture width.

By means of PG03, RG03 and CG02 the pulse-width modulated square voltages become integrated into a parabolic voltage. This is passed to the input of the comparator as a feedback. At the same point a voltage is applied from the "chassis point" of the line transformer. This voltage represents the current in the picture tube. This will correct the width alteration consequential upon varying beam current.

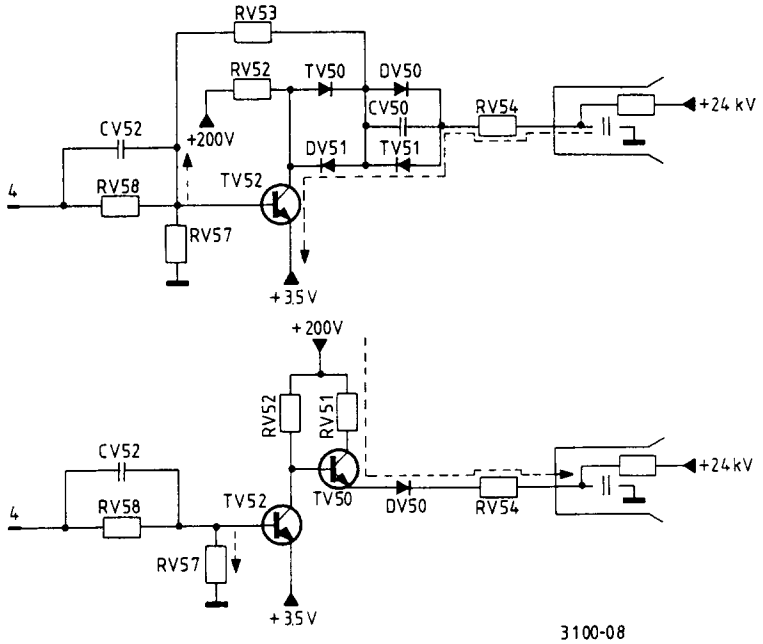
Automatic cut-off
Video output stage

The description explains red output only, but the functions are identical for the green and blue outputs.



The voltage amplification takes place in the transistor TV52. The ratio of the resistors RV58 and RV53 determine the magnitude of this amplification (40 times).
The internal capacitance of the picture must be charged and discharged by the video output stage.

The currents for charging (a) and discharging (b) respectively are shown in Fig. 08.

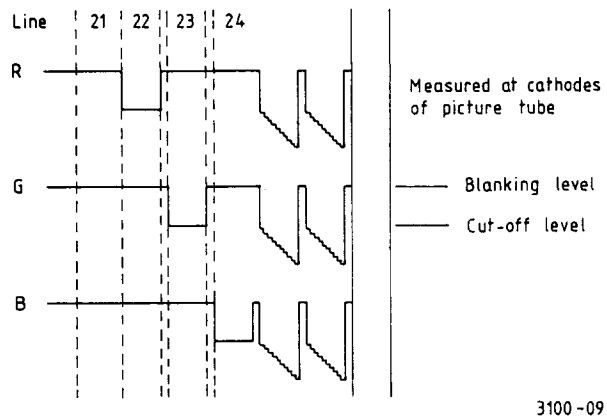


Other functions

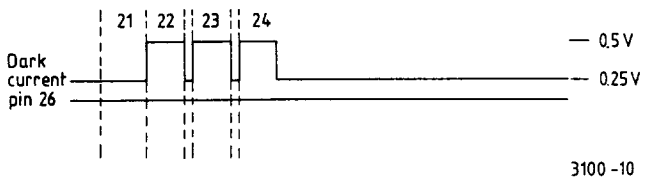
- TV81 is a cut-out transistor
- CV52 is a speed-up capacitor
- PV50/PV70 are adjustment potentiometers for cut-off values

Cut-off control

Automatic cut-off control is performed in IV02 (TDA 3506) via the video output amplifier. By means of an internal counter in TDA 3506 a defined level is supplied in the lines 21 - 22 - 23 - 24 to drive the picture tube.



Drive for "Blanking" takes place in line 21. Drive for cut-off level takes place in the lines 22(R), 23(G) and 24(B) (approx. 10µA beam current). The beam current is passed through TV51 to the resistors PV50 and RV50 and will in these result in a certain voltage, Um.



Um is taken to IV02 TDA 3506, pin 26.
In line 21 (R, G, B) Um equals the leakage current of the picture tube. It is sampled and a voltage which is an expression of the value is stored on pin 27.
In line 22(R) the beam current is measured and in the comparator the result is compared with a reference voltage. This is the sum of an internal reference voltage (0.5V) and a voltage which is an expression of the leakage current of the picture tube.
The resultant voltage is stored in CV40 until the next measuring period 20ms later. This is passed on to video output in IV02 where it determines the cut-off point for the appropriate gun in the picture tube.

Sound Module
General

5.5MHz and 5.74MHz are demodulated in the sound module PCB20(21). The IC's ID35 and ID26 are used for this function. After de-emphasis the signal is matrixed in ID51 which also performs the switching between languages 1/2 and stereo. This switching is controlled by ID01, which identifies the composition of the sound signal and controls the indication logic, which is made up of TS32, TS35, TS42, and TS43 etc.

IS04 switches between internal/external signal and IS07 switches between

Stereo
Stereo enhanced
Mono
Pseudo-stereo

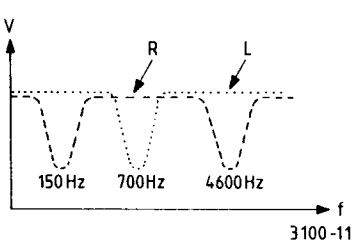
IS08 regulates Bass, Treble, Balance, and Volume before the signal reaches the integrated output stage IS01, IS11, which drive the loudspeakers.

Stereo enhanced

The two operational amplifiers IS06 are used to provide a larger base expansion of a stereo signal. This is obtained by a 180° phase inversion of the audio information in the two channels and adding it to the opposite channel.
Signals with the same phase and amplitude in the two channels are reduced (the centre signal), which provides the impression of a wider channel separation and thus a wider base width.
Since low-frequency (bass) signals often have the same phase and amplitude in the two channels, they will be reduced = less bass. To avoid this drawback the transmission capacitors for the phase inverted signals have been selected so as not to transmit frequencies below 150Hz.

Pseudo stereo

This effect is obtained by making the frequency response characteristics different for the left-hand and the right-hand outputs (see Fig. 11)



The frequencies have been selected so as to give the impression that the human voice is centered between the two loudspeakers whereas other sounds seem spread out.
The frequency filter consists of the components in the input of IS06, pins 3, 5, and 6.

System Control
General

The System Control has been designed with a 4-bit microcomputer IR01 (HMS46).

IR01 handles the following functions:

- decoding of IR signals
- operating panel scanning
- display control
- tuning control
- program storage
- audio and video regulation controls
- teletext decoder control
- miscellaneous functions

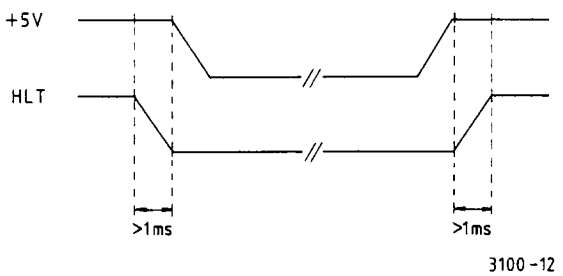
HMS has a storage capacity of 4k nibble (ROM) and 256 nibble (RAM).

Reset circuit

IR01 is reset by a high level on pin 15. TR84 and its surrounding components make up the reset circuit (see diagram).
When 5V starts up the collector of TR78 will go from 0V to 5V. TR84 will go ON for approx. 6 ms which is the time it takes to charge CR82 to +5V.
At turn off CR82 is rapidly discharged via DR84 and RR86.

The "HALT" function

In "halt" mode (pin 19 = LOW) the microprocessor has a greatly reduced power consumption (less than 12μA), and the battery BR87 will be able to supply it for up to 6 months to avoid loss of data in the RAM and other registers.
It is important that, on start up, HLT goes high only when +5V is present.
At turn off HLT must go low before +5V disappears (see time diagram).



These delays are obtained by means of the transistors TR71, TR76, TR78, and TR81.

Start up

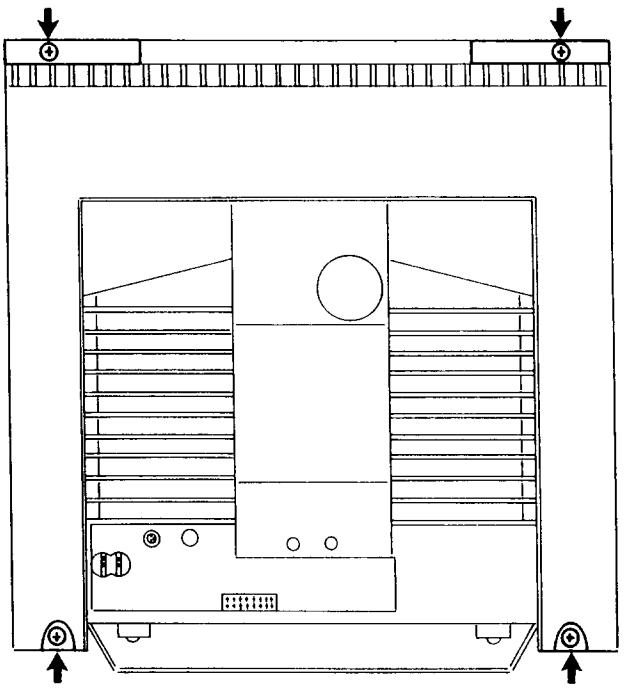
TR78 is considered shorted during start up.
TR76 is off and HLT is thus low until the collector of TR74 goes low. This occurs when +5V overrides the zener voltage in DR75, in other words: *when* +5V *is* indeed present.
Then HLT will go high.

Turn Off

During normal operation TR78 is kept ON by TR81/TR71.
When +12.5V starts to drop, the base voltage on TR71 will also drop.
At approx. 9.5V TR71 and thus TR81 and TR78 will go OFF.
HLT will then drop to 0V whereas +5V will remain intact.

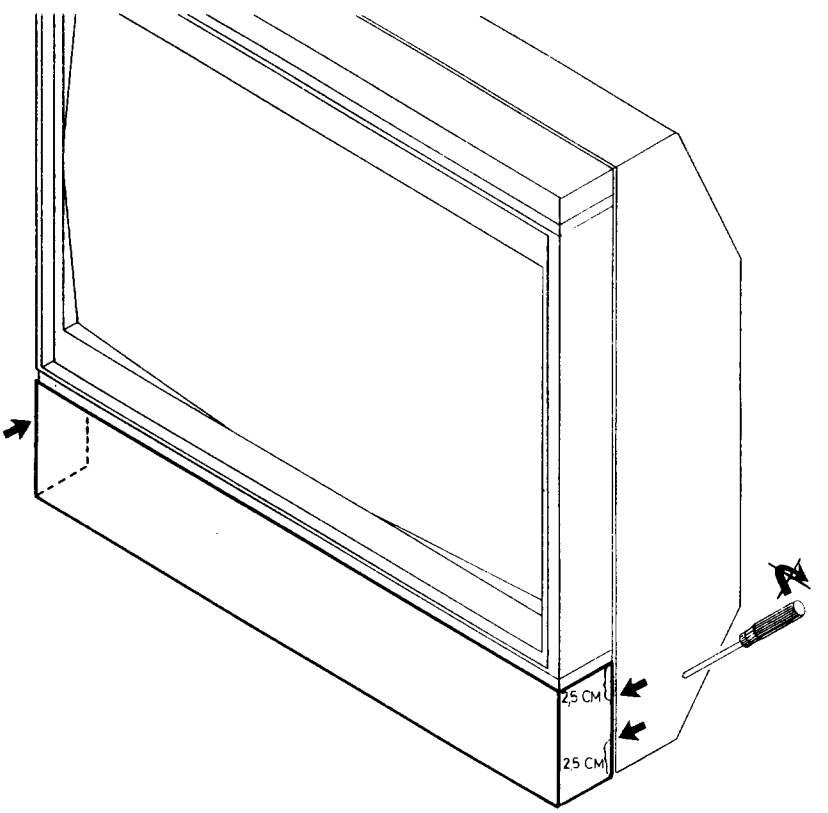
DISMANTLING

Rear part



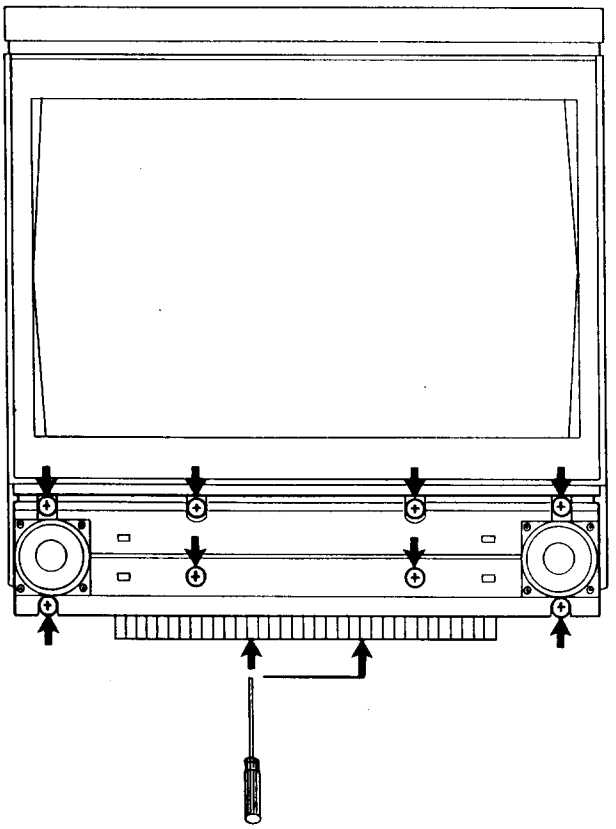
Loosen the four screws in the rear part, which can then be removed.

Loudspeaker panel



Insert a screwdriver between the loudspeaker panel and the main frame at the *right side.* A slight pressure will loosen the loudspeaker panel, and it is removable from the left towards the right.
A slight rearwards pressure against the left corner will release the loudspeaker panel completely.

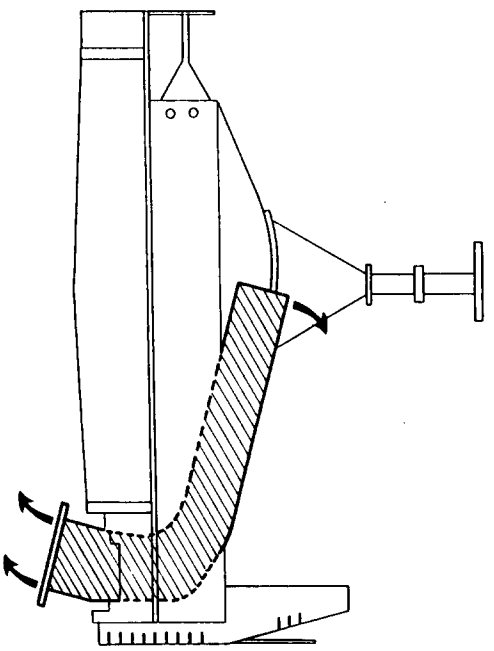
Loudspeaker baffle



Remove the eight screws, and a slight pressure from below against the points indicated will release the loudspeaker baffle.

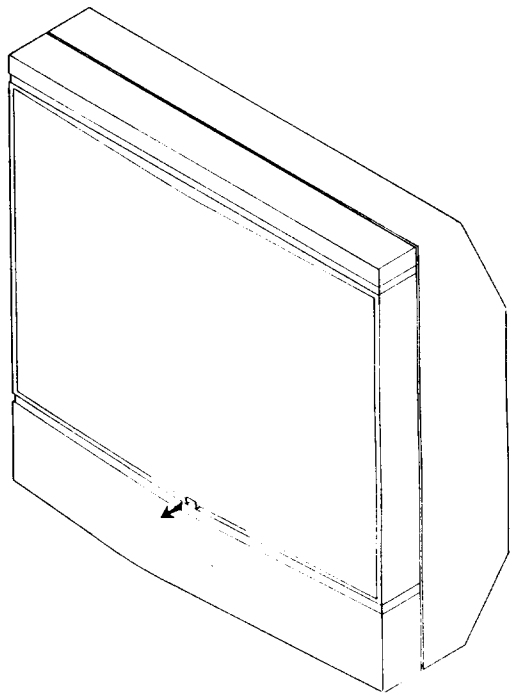
When removing the loudspeaker baffle, pull slightly upwards, whereby the two loudspeaker damper tubes are moved to horizontal position.

Loudspeaker



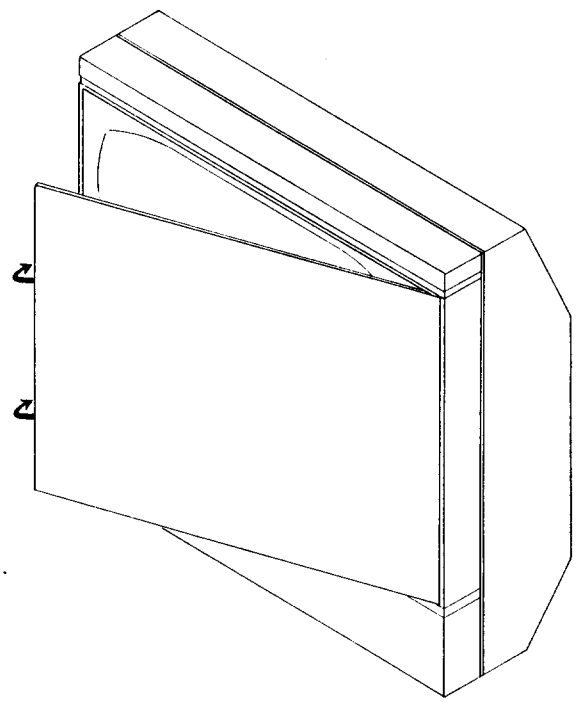
When replacing a loudspeaker, make certain that the new unit is oriented with its terminals downwards, and finally *tighten diagonally*.

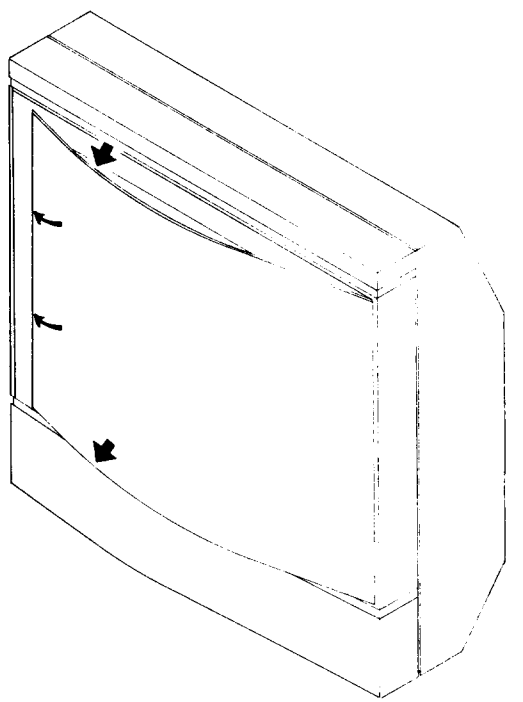
Dismantling of contrast screen



The contrast screen may be removed by pulling at the slot illustrated.

Fitting of contrast screen





Place one edge in the groove and hold in place.
Bend the screen slightly by holding at the top and the bottom at the other edge and press the contrast screen into the groove.
Make sure the screen is pressed down in the full length of the groove.

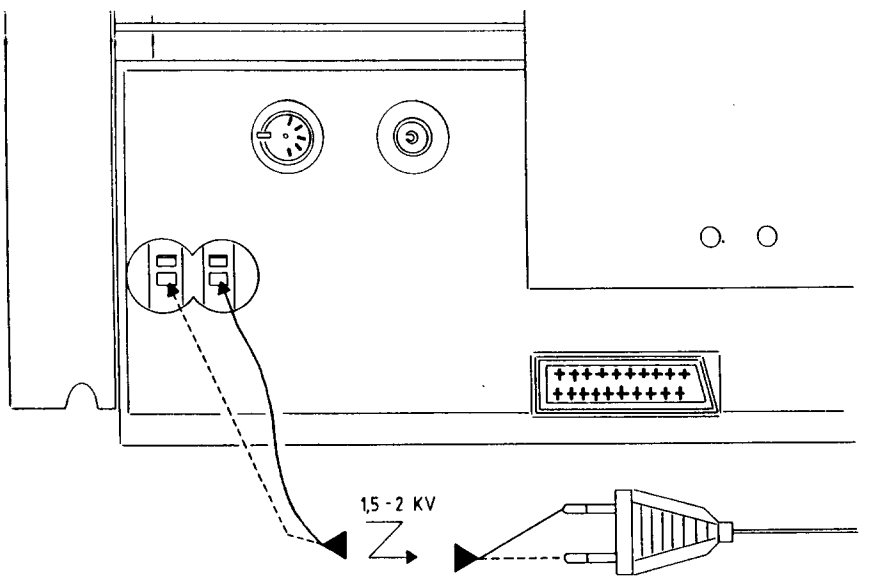
INSULATION TEST

Each set **must** be insulation tested after it has been dismantled. The test is to be carried out when the set has been re-assembled and is ready for delivery to the customer.

The insulation test is carried out in the following way:

Short-circuit the two plug pins of the main plug and connect one of the terminals of the insulation tester. Connect the other terminal of the insulation tester to the chassis pin of one of the loudspeaker sockets.

Set the mains switch in ON position.



NOTE!
To avoid ruining the set, it is essential that both insulator test terminals are in really good mechanical contact.

Now turn slowly the voltage control up on the insulation tester until a voltage of 1.5-2 kV is obtained. Hold it there for 1 sec., the turn slowly the voltage down again.

At no point during the test procedure any flash-overs are permissible.

SERVICE TIPS

When replacing the 01DF08 thyristor, diode 01DF09 must be replaced also.
Both parts are available under part no. 8300488.

FINAL TESTS

Connection

1.01 Connect the TV set to an aerial and a power supply.

1.02 Set the ON/OFF switch to on → display will show red dot.

Close Operation

2.01 Activate "tune" → the TV set comes ON, the screen lights up. Tune and fine tune are functioning on Program 1.

2.02 Activate "tune" to the TV station wanted.

2.03 Activate "fine tune" until a sharp picture is obtained.

2.04 Activate "volume" up and down → display counting.

2.05 Activate "contrast" up and down → display counting.

2.06 Activate "brilliance" up and down → display counting.

2.07 Activate "colour" up and down → display counting.

2.08 Regulate "balance" < >.

2.09 Regulate "bass" - +.

2.10 Regulate "treble" - +.

2.11 Set "expand" to + → display shows/, and it becomes audible that the sound picture has been expanded.

2.12 Set "expand" to -.

Inputs/Outputs

3.01 Check ancillary loudspeaker connection.

3.02 Check AMP/TAPE.

3.03 Check 21-pole A/V socket.

3.04 Check VHF/UHF aerial socket.

3.05 Connect e.g. a video tape recorder to the 21-pole A/V socket. When playing back the TV set switches to A/V mode.

3.06 Test the headphone socket.

Remote Control

4.01 Tuning: First activate "TV" and next "tune" → and the TV set will advance the nearest next station. Display will show: Ch and xx.

4.02 Fine tuning: Activate "fine tune" on the control panel until the picture becomes sharpest. Display will show: Ch, xx, Pr, and xx.

4.03 Activate "store". This will store the set transmitter frequency under a program number. The Display will show: Ch, xx, Pr, and xx.

4.04 Activate "volume" up and down. The sound will increase and decrease, → the display will be counting.

4.05 Activate "brilliance" up an down. The brightness will increase and decrease, → the display will be counting.

4.06 Activate "colour" up and down. The colours will get more or less saturated, → the counter will be counting.

4.07 Activate "step" up and down. Program will advance to - or go backwards from - the next program, → display will show program No. xx.

4.08 Activate "mute" and the sound will disappear, → the display will show - . When "mute" is again activated, the sound will return. The display will show - .

4.09 Activate "reset". The TV set will be set to the value of the setting for close operation. Display will show - .

4.10 "sound". Tune the TV set to a station telecasting a dual language programme. When activating "sound", language A or B is selected. The display will show < or >.

4.11 "sound". Tune the TV set to a station telecasting a stereo programme. The display will show < >. Activating "sound" switches between stereo and mono. The TV set will start up in stereo mode.

4.12 Activate " - ". The TV set will go into stand by mode, → the display will show ".".

4.13 The TV set can be turned ON by activation of:
A Any Programme No. from 0-34
B "step"
C "TV"
D "reset"
E "mute"

4.14 When selecting programmes 33 or 34, → the display will show < > AV.

4.15 Direct selection of channel: Activate "TV" - "tune", next select the channel required (0-99).

Picture

5.01 Check that the picture has the correct geometry, white balance and grey balance.

Cabinet

6.01 Check the cabinet for cosmetic blemishes.

Cleaning of screen/contrast screen

7.01 The screen/contrast screen may be wiped with a cloth wrung in water with ordinary detergent.
A little rinse aid may be added in order to avoid static electricity.
Methylated spirits should be avoided.

For further information, consult the owner's manual.